

[No database/cluster active] ..fiepodoc



Database: EPODOC

[EPODOC: SS 1] /ic C10J3/42 or C10J3/48 or C10L3/00 or B01D45/14 or C10J3/20 or C10J3/26 or C10J3/46 or C10J3/66

Results in EPODOC 31.171

[SS 2] rotating 1w grill

Results in EPODOC 104

[SS 3] 1 and 2

Results in EPODOC 5

[SS 4] ..li



1/5 © EPODOC / EPO

PN - [US2003221278](#) A1 20031204

PNFP - US6916351 B2 20050712

PR - KR20020030721 20020531

AP - US20020271884 20021016

DT - **

CT - || STSE (B2)

[US6810558](#) B2 20041102 [] (LEE YONG-HEE [KR])

- || R141 (A1)

[US5275634](#) A [];

[US6521006](#) B2 [];

[US5948127](#) A [];

[US5066315](#) A [];

[US6810558](#) B2 []

CCI - [A47L9/1675](#) ; [A47L9/20](#) ;

[B01D45/14](#) ; [B04C5/13](#) ;

[B04C5/22](#) ; [B04C9/00](#)

CCA - [B04C2009/007](#) ; [Y10S55/03](#)

PA - (B2)

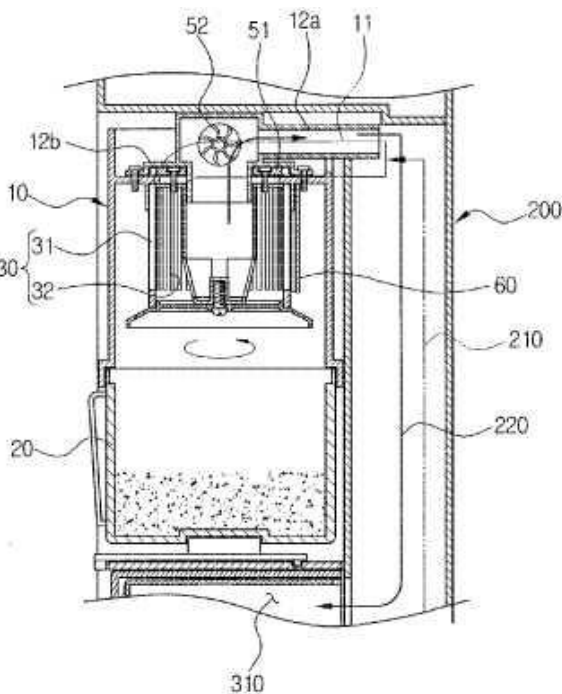
SAMSUNGKWANGJUELECTRONICS
CO [KR]

TI - (A1 B2)

Cyclone-type dust collecting
apparatus for a vacuum cleaner

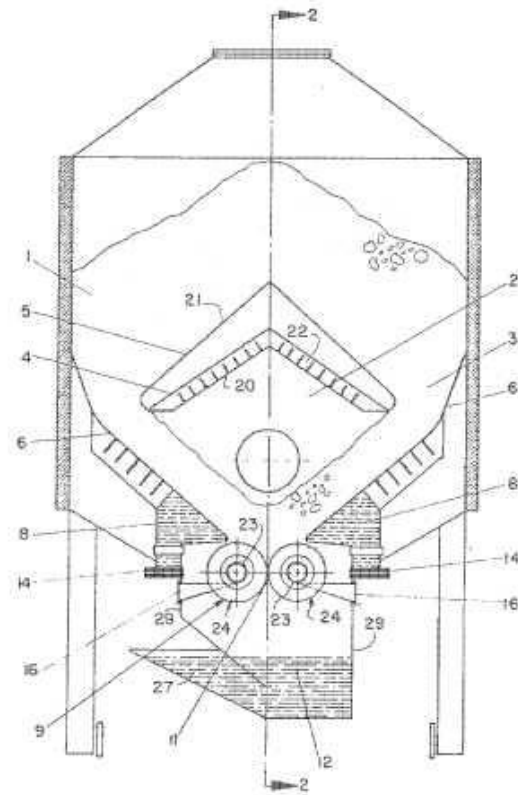
AB - (A1 B2)

The cyclone-type dust-collecting



apparatus for a vacuum cleaner according to the disclosed invention has a grill cleaning means for automatically removing fine dusts covering the grill when the cleaner is in use. The grill cleaning means preferably comprises a grill rotating means for **rotating the grill** while the cleaner is in use and a dusting member disposed to extend along one side of the inner cyclone body to contact the outer circumference of the **rotating grill**. The grill rotating means comprises a rotation member disposed at top of the cyclone body to rotatably support the grill in relation to the cyclone body and to rotate together with the grill, connected with the grill by a number of connection members, and having an upper surface of the cyclone body excluding the air discharge port positioned in between, and provided with a gear portion formed around the outer circumference, a driving source for providing driving force for rotating the rotation member, and a power transferring means for transferring power of the driving source to the rotation member. The driving source may comprise a turbine fan disposed in the discharge pipe of the air discharge unit to be rotated by air discharged through the discharge pipe.

- PN - [US4274341](#) A 19810623
- PR - TR19780010184 19781207
- AP - US19790065877 19790813
- DT - *
- CT - || STSE (A)
[US514994](#) A 18940220 [];
[US1023567](#) A 19120416 [] (HUETTINGER WILHELM R [US]);
[US1897950](#) A 19330214 [] (U G I CONTRACTING COMPANY);
[US2071678](#) A 19370223 [] (JULIENBELLAY);
[US2147324](#) A 19390214 [] (KOPPERS CO INC);
[US2488969](#) A 19491122 [] (BBC BROWN BOVERI & CIE);
[US2788961](#) A 19570416 [] (VICKERS ARMSTRONGS LTD);
[US3277945](#) A 19661011 [] (FRANKLIN INSTITUTE)
- CCI - [C10J3/08](#) ; [C10J3/20](#) ; [C10J3/30](#) ;
[C10J3/32](#) ; [C10J3/40](#) ; [C10J3/42](#) ;
[C10J3/76](#) ; [F23M5/08](#) ;
[F23B1/165](#) ; [F23B90/06](#) ;
[F23H15/00](#) ; [F23J1/00](#)
- CCA - [C10J2300/093](#) ; [C10J2300/0956](#)
- PA - OZALTAYHUSEYINC
- TI - Coal gasifying burner
with **rotating grill**
- AB - A coal gasifying burner characterized by a **rotating grill** which is composed of grill disks arranged on two pipes with a narrow gap between the grills and which rotates very slowly inwards when viewed from the top sloped side walls made of metal sheet having a sloper compatible with coal flow, a cylindrical jacket placed around the periphery of the nozzle which delivers combustion air to the burner, gasification of a quantity of coal located on the sloping side walls around a narrow area where coal combustion takes place, and combustion of the generated coal gas outside of the burner by secondary air which cools the system and gets heated



itself by the coal cooking process.

3/5 © EPODOC / EPO

PN - [GB2389064](#) A 20031203

PNFP - GB2389064 B 20040721

PR - KR20020030721 20020531

AP - GB20030000942 20030115

DT - *

CT - (A B)
[GB2230474](#) A []; [EP0841095](#) A2 [];
[JPH08206543](#) A []; [US5275634](#) A [];
[SU413960](#) A1 []

CTNP - (A B)
[] WPI ABSTRACT, Acc. No. 1974-80467; & SU 413960 A1
(DOBROKHOTOV V D ET AL) (05-02-1974)

CCI - [A47L9/1675](#) ; [A47L9/20](#) ; [B01D45/14](#) ; [B04C5/13](#) ; [B04C5/22](#) ; [B04C9/00](#)

CCA - [B04C2009/007](#) ; [Y10S55/03](#)

PA - (A B)
SAMSUNG KWANGJU ELECTRONICS CO [KR]

TI - (A)
Self-cleaning mechanism for cyclone overflow grill

- (B)
Cleaning mechanism for a cyclone grill

AB - (A)
The cyclone-type dust-collecting apparatus for a vacuum cleaner according to the disclosed invention has a grill cleaning means for automatically removing fine dusts covering the grill 30 when the cleaner is in use. The grill cleaning means preferably comprises a grill rotating means (50, fig 3) for **rotating the grill** while the cleaner is in use and a dusting member 60 disposed to extend along one side of the inner cyclone body (10, fig 1) to contact the outer circumference of the **rotating grill**. The grill rotating means comprises a rotation member (51, fig 3) disposed at top of the cyclone body to rotatably support the grill in relation to the cyclone body and to rotate together with the grill, connected with the grill by a number of connection members, and having an upper surface of the cyclone body excluding the air discharge port (10b, fig 3) positioned in between, and provided with a gear portion (51b, fig 6) formed around the outer circumference, a driving source for providing driving force for rotating the rotation member, and a power transferring means for transferring power of the driving source to the rotation member via a worm gearing 54, 55. The driving source may comprise a turbine fan 52 disposed in the discharge pipe 12a of the air discharge unit to be rotated by air discharged through the discharge pipe, or may comprise a motor (52a, fig 7).

4/5 © EPODOC / EPO

PN - [EP0019663](#) A2 19801210

PNFP - EP0019663 A3 19810107

PR - TR19780010184 19781207

AP - EP19790104903 19791204

DT - **

CT - || STSE (A3)
[CH242483](#) A 19460515
 [A] (TREIBERHERMANN [AT]);
[DE218677](#) C 00000000 [];
[DE238861](#) C 00000000 [];
[DE258114](#) C 00000000 [];
[DE396661](#) C 19240606 [] (ADLER
 & HENTZEN);
[DE429424](#) C 19260602 []
 (RUDOLF DRAWE DR ING);
[DE409766](#) C 19250213 [] (MAX
 BIRKNER);
[DE438482](#) C 19261229 [] (MAX
 BIRKNER);
[DE627809](#) C 19360324 []
 (ALFRED ROGGER);
[DE720818](#) C 19420516 []
 (WALTHER & CIE AG)

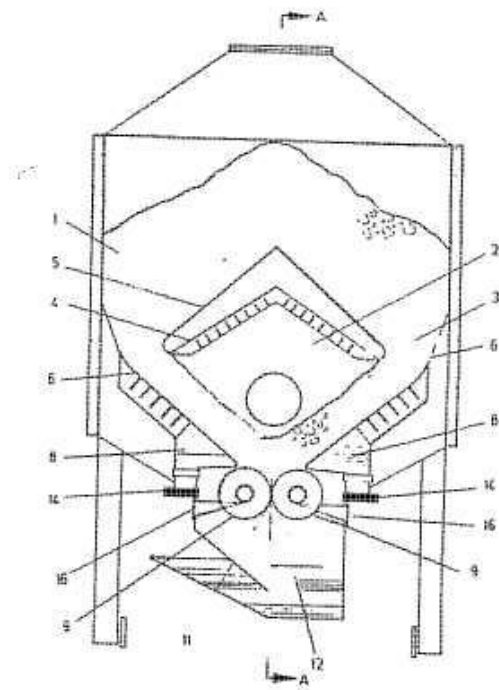
CCI - [C10J3/08](#) ; [C10J3/20](#) ; [C10J3/30](#) ;
[C10J3/32](#) ; [C10J3/40](#) ; [C10J3/42](#) ;
[C10J3/76](#) ; [F23M5/08](#) ;
[F23B1/165](#) ; [F23B90/06](#) ;
[F23H15/00](#) ; [F23J1/00](#)

CCA - [C10J2300/093](#) ; [C10J2300/0956](#)

PA - (A2)
 ISSY KAZAN SANAYII LTD [TR]
 - (A3)
 ISSY KAZAN SANAYII LTD SIRKETI
 [TR]

TI - (A2 A3)
 Coal gasifying burner.

AB - (A2)
 A coal gasifying burner has
 a **rotating grill** comprising two
 grill cylinders (9) spaced from
 each other by a narrow gap (11).
 Each grill cylinder mainly
 consists of a shaft on which a
 plurality of discs (10) is
 mounted. The grill cylinders
 rotate very slowly inwards when
 viewed from the top. Side walls
 (6) made of metal sheet are
 sloped in compliance with the
 coal flow from a coal storage (1)



to a combustion cell (2). A cylinder (15) surrounding the burner nozzle introduces the combustion air. The excessive coal located on the sloping side walls in the vicinity of the combustion of coal is gasified and the gases generated thereby are burnt outside of the burner with secondary air which has been introduced into the coal gasifying burner for cooling it and has thereby been heated itself.

5/5 © EPODOC / EPO

PN - [CA2413398](#) A1 20031130

PR - KR20020030721 20020531

AP - CA20022413398 20021203

DT - I

CCI - [A47L9/1675](#) ; [A47L9/20](#) ; [B01D45/14](#) ; [B04C5/13](#) ; [B04C5/22](#) ; [B04C9/00](#)

CCA - [B04C2009/007](#) ; [Y10S55/03](#)

PA - SAMSUNG KWANGJU ELECTRONICS CO [KR]

TI - CYCONE-TYPE DUST COLLECTING APPARATUS FOR VACUUM CLEANER

AB - The cyclone-type dust-collecting apparatus for a vacuum cleaner according to the disclosed invention has a grill cleaning means for automatically removing fine dusts covering the grill when the cleaner is in use. The grill cleaning means preferably comprises a grill rotating means for **rotating the grill** while the cleaner is in use and a dusting member disposed to extend along one side of the inner cyclone body to contact the outer circumference of the **rotating grill**. The grill rotating means comprises a rotation member disposed at top of the cyclone body to rotatably support the grill in relation to the cyclone body and to rotate together with the grill, connected with the grill by a number of connection members, and having an upper surface of the cyclone body excluding the air discharge port positioned in between, and provided with a gear portion formed around the outer circumference, a driving source for providing driving force for rotating the rotation member, and a power transferring means for transferring power of the driving source to the rotation member. The driving source may comprise a turbine fan disposed in the discharge pipe of the air discharge unit to be rotated by air discharged through the discharge pipe.

[SS 4] ..v

[EPODOC: SS 4] gasification and 1

Results in EPODOC 8.179

[SS 5] multiple and 4

Results in EPODOC 131

[SS 6] biomass and 5

Results in EPODOC 39

[SS 7] ..li



1/39 © EPODOC / EPO

PN - [CN107189821](#) A 20170922
PR - CN20171592441 20170719
AP - CN20171592441 20170719
DT - I
CNOI - [C10J3/485](#) ; [C10J3/506](#) ; [C10J3/526](#) ; [C10J3/76](#)
CCA - [Y02E20/18](#)
CNOA - [C10J2300/092](#) ; [C10J2300/093](#) ; [C10J2300/0943](#) ; [C10J2300/0946](#) ; [C10J2300/0956](#) ; [C10J2300/0959](#) ; [C10J2300/0969](#) ; [C10J2300/0976](#) ; [C10J2200/152](#)
PA - HUANENG CLEAN ENERGY RES INST
TI - Dry coal powder and **biomass** coupled co-**gasification** downward chilling gasifier
AB - The invention provides a dry coal powder and **biomass** coupled co-**gasification** downward chilling gasifier. The dry coal powder and **biomass** coupled co-**gasification** downward chilling gasifier comprises a gasifier shell. A water cooled wall with a circulating water inlet and a circulating water outlet is arranged in the gasifier shell. **Multiple** gas pulverized coal nozzles are arranged on the upper portion of the gasifier shell in the horizontal direction, a **biomass** and gasifier ignition and operation integrated nozzle is arranged on the top of the gasifier shell in the vertical direction, and the nozzle is fixed and sealed through a top cover and the gasifier shell. The bottom of the water cooled wall is connected with the top of a chilling tank through a pass partition plate, the bottom of the pass partition plate is connected with a chilling ring, the chilling ring is connected with the top of a down pipe, a bubble breaker is fixed between the outer wall of the down pipe and the inner wall of the gasifier shell, a chilling water entrance of the chilling ring is communicated with a chilling water inlet formed in the outer wall of the chilling tank, and a synthesis gas outlet and a slag water outlet are formed in the outer wall of the chilling tank. Pulverized coal and **biomass** are co-gasified, control over the temperature of the gasifier is convenient, a downward chilling mode is adopted, and a following purification and dust removal system is low in burden, low in energy consumption and high in efficiency.

2/39 © EPODOC / EPO

PN - [CN106118757](#) A 20161116
PR - CN20161521153 20160629
AP - CN20161521153 20160629
DT - I
CNOI - [C10J3/20](#) ; [C10J3/84](#)
CNOA - [C10J2300/0916](#)
PA - WEN ZHOU
TI - **Biomass** gasifier with gas supply equipment
AB - The invention discloses a **biomass** gasifier with gas supply equipment. The **biomass** gasifier comprises a vertically-arranged gasifier body, a secondary pyrolysis chamber, an annular ventilation pipe, **multiple** fans, **multiple** gas inlet pipes and a gas guide pipe; the gasifier body comprises a **gasification** chamber, a combustion chamber and a gas collection chamber; the

secondary pyrolysis chamber is arranged outside the combustion chamber in a surrounding mode; the annular ventilation pipe is arranged outside the secondary pyrolysis chamber in a surrounding mode, the inner side wall of the annular ventilation pipe is the outer side wall of the secondary pyrolysis chamber, **multiple** gas holes are formed in the inner side wall of the annular ventilation pipe, the hole passage directions of every two adjacent gas holes are different, and the annular ventilation pipe is communicated to a high-temperature air supply device; the fans are arranged in the annular ventilation pipe, and the rotating speeds of the fans are different; one end of each gas inlet pipe stretches into the combustion chamber in the tangential direction of the combustion chamber, and the other end of each gas inlet pipe is communicated with a combustion-supporting gas supply device arranged outside the gasifier body; one end of the gas guide pipe is communicated to the gas collection chamber, and the other end of the gas guide pipe is communicated to the secondary pyrolysis chamber. The **biomass** gasifier decreases the tar content of combustible gas.

3/39 © EPODOC / EPO

PN - [CN105889982](#) A 20160824

PR - CN20161401623 20160611

AP - CN20161401623 20160611

DT - I

CT - || STSE (A)

[CN102703132](#) A 20121003 [A] (ANHUI XIYANG YANGXIN ENERGY TECHNOLOGY CO LTD)

[A] 1-9

* 全文 *;

[CN104694168](#) A 20150610 [Y] (ZHOU YONG)

[Y] 1-9

* 说明书第[0017]-[0019]段、附图1 *;

[JP2015135223](#) A 20150727 [A] (NANIWA ROKI KENKYUSHO KK)

[A] 1-9

* 全文 *;

[CN204853504U](#) U 20151209 [Y] (YANGZHOU STAR BOILER CO LTD)

[Y] 1-9

* 说明书第[0015]-[0017]段、附图1 *;

[CN205979883U](#) U 20170222 [R] (ZHOU YONG)

[R]

* 权利要求第1-9项 *

CNOI - [C10J3/20](#) ; [C10J3/76](#) ; [C10J3/84](#) ; [F24B1/189](#) ; [F24B1/191](#) ; [F24B1/192](#)

CNOA - [C10J2300/0916](#) ; [C10J2300/0986](#) ; [C10J2300/1246](#)

PA - ZHOU YONG

TI - Furnace core structure of **biomass** downdraft type **gasification** device

AB - The invention discloses a furnace core structure of a **biomass** downdraft type **gasification** device. **Multiple gasification** air inlet nozzles and ignition combustion-supporting holes which extend downwards in an inclined mode are formed at the periphery of a throat; the furnace core structure is characterized in that an annular ignition combustion-supporting cavity is formed in the inner side of a **gasification** reaction chamber, and the ignition combustion-supporting holes are connected with the annular ignition combustion-supporting cavity from the angles of tangent lines of the annular ignition combustion-supporting cavity; a **gasification** air inlet annular baffle is arranged at the position, located at the upper sides of the **gasification** air inlet nozzles, of the throat. The furnace core structure has the advantages that the structure is compact, ignition speed is higher, and ignition time is saved; in the ignition process, the smoking phenomenon is remarkably reduced, and more environmental friendliness is achieved;

the **gasification** reaction temperature is high and can reach 1200 degrees, temperature-rise starting time is short, ignition is convenient to conduct, and gas is produced efficiently; pyrocarbon is adopted as a tar splitting catalyst, the structure is novel, the tar content can be remarkably lowered, filtering and dedusting equipment of a **gasification** furnace can be simplified, and the furnace core structure particularly has an active propelling function for application and popularization of a large or medium size **biomass gasification** furnace.

4/39 © EPODOC / EPO

PN - [CN105861061](#) A 20160817
 PR - CN20161401628 20160611
 AP - CN20161401628 20160611
 DT - I
 CNOI - [C10J3/20](#) ; [C10J3/723](#) ; [C10J3/725](#) ; [C10J3/74](#)
 CNOA - [C10J2300/0916](#) ; [C10J2300/0956](#)
 PA - ZHOU YONG
 TI - Novel furnace core structure of medium and large **biomass gasification** device
 AB - The invention discloses a novel furnace core structure of a medium and large **biomass gasification** device. The novel furnace core structure comprises a furnace core of an inverted bell type structure. The furnace core is sequentially provided with a stock bin funnel opening, a throat and a **gasification** and reduction chamber which are connected end to end from top to bottom. An inner ejector for ejecting air to the furnace core is arranged in the middle of the throat. A number of oxidation air nozzles are evenly distributed on the inner ejector. The throat is further provided with a number of oxidation air nozzles which are distributed annularly at different levels. **Multiple** layers of air inlet ducts and a number of air inlet valves connected with the air inlet ducts in a one-to-one correspondence mode are arranged on the periphery of the upper portion of the furnace core. Ignition air ducts are arranged on the peripheries of the air inlet ducts and connected with igniters correspondingly. The novel furnace core structure has the advantages that the automation degree is high, and the **biomass** fuel **gasification** rate is high; the novel furnace core structure is suitable for medium and large **biomass** gasifiers and has an active promotion effect on expanded application of renewable **biomass** energy.

5/39 © EPODOC / EPO

PN - [CN205313472U](#) U 20160615
 PR - CN20152873076U 20151103
 AP - CN20152873076U 20151103
 DT - I
 PA - BING CUN TIAN XIA THERMAL TECH CO LTD
 TI - **Biomass** briquette fuel **gasification** equipment
 AB - The utility model discloses a **biomass** briquette fuel **gasification** equipment, including band conveyer, feed arrangement, **gasification** storehouse, gas pipeline, water tank, travelling grate, air -blower, the grey device of play and transmission, be equipped with the (mixing) shaft in the **gasification** storehouse, **gasification** storehouse left end is connected with the air -blower, and **gasification** storehouse right -hand member is connected with the water tank. The device technology is advanced, reasonable in design, and simple structure, area is little, and the furnace height is saved equipment cost and is reached 30% -40% no longer than 8 meters, adopt single -stage hydraulic pressure feed arrangement and hydraulic pressure to go out grey device, the leakproofness is good, **gasification** reaction is thorough, and **biomass gasification** is rated more than 95%, and the grey quantity of slag is little, is applicable to **multiple biomass** fuel, waste discharge not in the production process, the feature of environmental protection is good,

adoption pressurized firing technique, the lime -ash that produces in the **gasification** can not get into the gas pipeline, and tar and pyroligneous acid be the after -flame in the storehouse of gasifying, avoids stopping up the gas pipeline, the device adopts intelligent frequency conversion control, and the security of system's operation is good with stability.

6/39 © EPODOC / EPO

PN - [CN105570874](#) A 20160511

PNFP - CN105570874B B 20171226

PR - CN2016179133 20160204

AP - CN2016179133 20160204

DT - I

CT - || STSE (A)

[EP0029795](#) A1 19810603 [A] (PILLARD CHAUFFAGE [FR])

[A] 1-3

* 全文 *;

[CN201081254Y](#) Y 20080702 [A] (LIANGQI MA [CN])

[A] 1-3

* 全文 *;

[CN201184613Y](#) Y 20090121 [A] (DAYONG LIN [CN])

[A] 1-3

* 全文 *;

[JP2010276201](#) A 20101209 [A] (MEIHO ECO TECHNO KK)

[A] 1-3

* 全文 *;

[CN102607066](#) A 20120725 [A] (DEGUANG ZHOU)

[A] 1-3

* 全文 *;

[CN205480944U](#) U 20160817 [R] (COTTON RES INST SHANXI ACAD OF AGRICULTURAL SCIENCES)

[R] 1-3

* 权利要求1-3 *

CNOI - (A)

[C10J3/20](#) ; [F23B10/02](#) ; [F24B1/18](#)

CNOA - (A)

[C10J2200/36](#) ; [C10J2300/0916](#) ; [C10J2300/092](#) ; [C10J2300/0956](#) ; [C10J2300/16](#)

PA - (A)

COTTON RES INST SHANXI ACAD OF AGRICULTURAL SCIENCES

TI - (A)

Integrated type **biomass** self-operated cyclone **gasification** combustion furnace

AB - (A)

The invention relates to an integrated type **biomass** self-operated cyclone **gasification** combustion furnace, and belongs to **biomass gasification** furnaces. The technical problems that an existing **biomass** combustion furnace is severe in environmental pollution and incapable of outputting **biomass** char are mainly solved. According to the technical scheme adopted for solving the technical problems, the integrated type **biomass** self-operated cyclone **gasification** combustion furnace comprises a shell, a furnace foot, a furnace ring cover, a flue, a furnace door, a plug board groove, a plug board and a furnace base frame; the combustion furnace further comprises an inner barrel, a **multiple** rows of primary air inlet holes, a plurality of primary air adjusting grooves, a char discharging hopper, a combustion chamber inner barrel, a combustion chamber outer barrel, a secondary air inlet, eight to ten guide vanes and a plurality of primary air adjusting rings, primary air adjusting knobs and barrier strips; the

shell is a bottomless cylinder; the inner barrel is arranged in an inner cavity of the shell and located on the middle-lower portion of the inner cavity of the shell; the shell and the inner barrel are together installed on a bracket composed of the furnace foot and the furnace base frame; the furnace door is arranged on the bottom surface of the inner barrel.

7/39 © EPODOC / EPO

PN - [US2016024403](#) A1 20160128

PR - US201514875290
20151005; US20100795947
20100608; US20090248282P
20091002; US20090185492P 20090609

AP - US201514875290 20151005

DT - **

CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)

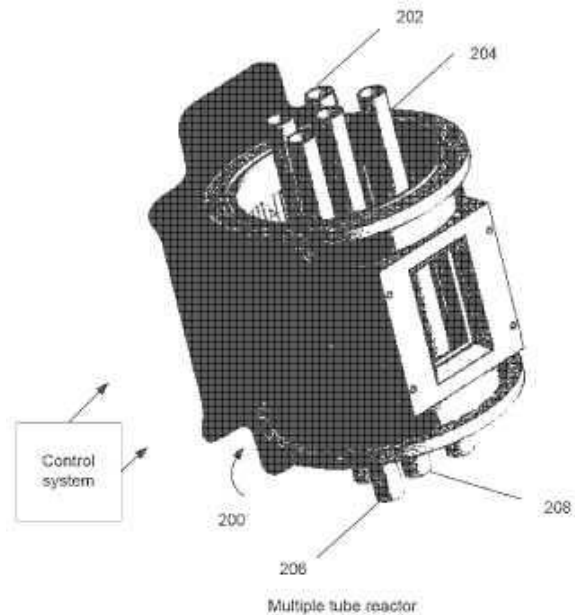
CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)

CLC - [C07C29/15](#) , [C07C31/04](#) , INV

- [C07C29/1518](#) , [C07C31/04](#) , INV

CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;
[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
[C01B2203/061](#) ; [C01B2203/84](#) ;
[C10G2300/1014](#) ; [C10G2300/1025](#) ;
[C10J2300/0906](#) ; [C10J2300/0909](#) ;
[C10J2300/0916](#) ; [C10J2300/0973](#) ;
[C10J2300/0989](#) ; [C10J2300/1284](#) ;
[C10J2300/1292](#) ; [C10J2300/1621](#) ;
[C10J2300/1659](#) ; [C10J2300/1665](#) ;
[C10J2300/1693](#) ; [C10L2200/0492](#) ;
[C10L2290/547](#) ; [C10J2200/09](#) ;
[C10L2290/08](#) ; [C10L2290/28](#) ;
[C10G2300/807](#) ; [C10L2290/52](#) ;
[C10L2290/50](#) ; [Y02P20/134](#) ;
[Y02P20/145](#) ; [Y02P20/129](#) ; [Y02P30/20](#) ;
[Y02P20/136](#)

CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
[B01J2219/00186](#) ; [C01B2203/0233](#) ;
[C01B2203/0811](#) ; [C01B2203/1241](#) ;
[C01B2203/1685](#) ; [C10J2300/094](#) ;
[C10J2300/0976](#) ; [C10J2300/0993](#) ;
[C10J2300/1223](#) ; [C10J2300/123](#) ;



[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)

- CQA - [Y02B40/18](#)
- PA - SUNDROP FUELS INC [US]
- TI - SYSTEMS AND METHODS FOR AN INDIRECT RADIATION DRIVEN GASIFIER REACTOR AND RECEIVER CONFIGURATION
- AB - A method, apparatus, and system for a solar-driven chemical plant are disclosed. Some embodiments may include a solar thermal receiver to absorb concentrated solar energy from an array of heliostats and a solar-driven chemical reactor. This chemical reactor may have **multiple** reactor tubes, in which particles of **biomass** may be gasified in the presence of a carrier gas in a **gasification** reaction to produce hydrogen and carbon monoxide products. High heat transfer rates of the walls and tubes may allow the particles of **biomass** to achieve a high enough temperature necessary for substantial tar destruction and complete **gasification** of greater than 90 percent of the **biomass** particles into reaction products including hydrogen and carbon monoxide gas in a very short residence time between a range of 0.01 and 5 seconds.

8/39 © EPODOC / EPO

- PN - [CN105219441](#) A 20160106
- PNFP - CN105219441B B 20180626
- PR - CN20151728173 20151031
- AP - CN20151728173 20151031
- DT - I
- PA - (A)
SU HAOQIANG
- TI - (A)
Gasification device provided with guiding part
- AB - (A)
The invention relates to a **gasification** device provided with a guiding part. The **gasification** device provided with the guiding part comprises a furnace body, a **gasification** component, a lighting-up tuyere and **multiple** temperature sensors, wherein a raw material inlet is formed in the upper part of the furnace body, a gas outlet and an ash discharging hole are formed in the lower part of the furnace body, the guiding part is arranged at the raw material inlet, the guiding part comprises a commutator and **multiple** guiding pipes, **multiple** openings are formed in the side wall of the commutator, and **multiple** guiding pipes are arranged on the openings of the commutator; the **gasification** component comprises a material placing plate and **multiple**

gasification pipelines, the material placing plate is conical, **multiple gasification** pipelines comprise one central **gasification** pipeline and **multiple** peripheral **gasification** pipelines, the central **gasification** pipeline is arranged at the top of the material placing plate, and **multiple** peripheral **gasification** pipelines are respectively arranged at the periphery of the material placing plate; the lighting-up tuyere is formed in the side wall of the furnace body; **multiple** temperature sensors are respectively arranged above and below the material placing plate and inside a raw material; **multiple gasification** pipelines are respectively communicated with an oxidizing agent supplying hole formed in the side wall of the furnace body. The **gasification** device provided with the guiding part has the advantages that the yields of tar and slag during **gasification** of **biomass** resource are reduced, and the **gasification** efficiency is also improved.

9/39 © EPODOC / EPO

PN - [CN105219438](#) A 20160106

PNFP - CN105219438B B 20171114

PR - CN20151627482 20150928

AP - CN20151627482 20150928

DT - I

CT - || STSE (A)

[WO2011095347](#) A3 20120531 [A] (PYROX GMBH [DE], et al)

[A] 1-7

* 全文 *;

[CN103980942](#) A 20140813 [A] (HEFEI DEBO BIOENERGY SCIENCE & TECHNOLOGY CO LTD)

[A] 1-7

* 全文 *;

[CN204981779U](#) U 20160120 [R] (ZHANG LIJUN)

[R] 1-7

* 权利要求1-7 *

PA - (A)

ZHANG LIJUN

TI - (A)

Gasification furnace for producing **biomass** charcoal

AB - (A)

The invention relates to a **gasification** furnace for producing **biomass** charcoal. The **gasification** furnace comprises a furnace body and a support, the furnace body is fixed to the support, a furnace lid is arranged at the top of the furnace body, an air inlet is formed in the furnace lid, an inner chamber of the furnace body is divided into a raw material section, a burning section and a cooling section in sequence from top to bottom, **multiple** vertical beams which are arranged in parallel are arranged in the burning section, a gap is formed between every two adjacent vertical beams, a **gasification** reaction chamber is formed in each vertical beam, the **gasification** reaction chambers are communicated with the inner chamber of the furnace body, a fuel gas outlet communicated with the burning section is formed in the side wall of the furnace body, a cooling device is arranged at the bottom of the inner chamber of the furnace body, the vertical beams are arranged on the cooling device, a carbon storage bin is arranged at the bottom of the furnace body, a discharge opening communicated with the carbon storage bin is formed in the bottom of the inner chamber of the furnace body, a discharger is arranged at the discharge opening, and a dump valve is arranged at the bottom of the carbon storage bin. According to the **gasification** furnace, **biomass** such as straw, nut shells and wood is adopted as raw materials, the raw materials can be gasified for being made into combustible gas and can further be made into carbonized materials for being recycled, and full utilization of the raw

materials is achieved.

10/39 © EPODOC / EPO

PN - [CN105176586](#) A 20151223

PNFP - CN105176586B B 20171010

PR - CN20151529723 20150826

AP - CN20151529723 20150826

DT - I

CT - || STSE (A)

[CN2888299Y](#) Y 20070411 [A] (JIANG GUIWAN [CN])

[A] 1-8

* 全文 *;

[CN201043759Y](#) Y 20080402 [A] (SHAOGUO YE [CN])

[A] 1-8

* 全文 *;

[RU2341727](#) C1 20081220 [A] (OOO NAUKA XXI [RU])

[A] 1-8

* 全文 *;

[CN201215328Y](#) Y 20090401 [X] (XIAOMING SHI [CN])

[X] 1-8

* 说明书第1页倒数第1段-说明书第2页第5段及附图1 *;

[CN201415990Y](#) Y 20100303 [A] (WENPING HU)

[A] 1-8

* 全文 *;

[EP2436752](#) A2 20120404 [A] (O GEN UK LTD [GB])

[A] 1-8

* 全文 *;

[CN102620319](#) A 20120801 [A] (DIANSONG LIU)

[A] 1-8

* 全文 *;

[CN202643645U](#) U 20130102 [A] (HONG LIANG)

[A] 1-8

* 全文 *;

[US2013047573](#) A1 20130228 [A] (MISHRA NIRAJ KUMAR [IN])

[A] 1-8

* 全文 *;

[CN205035328U](#) U 20160217 [R] (NANGONG SUONENG STRAW GASIFICATION DEV CO LTD)

[R] 1-8

* 权利要求1-8 *

CCA - [Y02P20/124](#)

PA - (A)

NANGONG SUONENG STRAW GASIFICATION DEV CO LTD

TI - (A)

Biomass gasification boiler

AB - (A)

The invention discloses a **biomass gasification** boiler, and belongs to the technical field of **biomass** boilers. The **biomass gasification** boiler comprises a boiler body, a boiler chamber, a feed inlet, an enclosed ash receiving chamber, a normally-closed ash outlet; the upper part of the boiler chamber is a charging hopper, and the lower part of the boiler chamber is a combustion chamber; a hollow boiler body interlayer is arranged between the boiler body

housing and the boiler chamber, the upper part of the interlayer is a flue channel, and the lower part is a water chamber; the center of the annular circumference of the water chamber is provided with vertical pipe bodies of **multiple** flue pipes; the **multiple** flue pipes are in the shape of U, and form a fire grate at the bottom of the combustion chamber; the annular circumference of the flue channel is provided with a plurality of water pipes; a plurality of gas inlet pipes are communicated between the U-shaped bottoms of the flue pipes and the enclosed ash receiving chamber; and the upper part of the boiler body interlayer is provided with a gas outlet pipe, a water inlet pipe and a water outlet pipe. The **biomass gasification** boiler is simple in structure, small in volume, low in manufacture cost, low in operation cost, convenient to operate and low in raw material requirement, utilizes incomplete combustion of fuel for generating carbon monoxide, is high in **gasification** efficiency, safe, energy-saving, friendly to environment and high in heat utilization rate.

11/39 © EPODOC / EPO

- PN - [CN204079916U](#) U 20150107
- PR - CN20142398223U 20140718
- AP - CN20142398223U 20140718
- DT - I
- PA - ZHENGZHOU LIWEI SAVING AND ENVIRONMENTAL PROT TECHNOLOGY CO LTD
- TI - **Biomass** gasifier
- AB - The utility model relates to a **biomass gasification** device. A **biomass** gasifier comprises a furnace body, wherein the furnace body comprises a material storage layer, a combustion layer and an ash discharging layer, wherein an oxygen aeration opening and a gas outlet are formed in the furnace body at the combustion layer; a slag outlet is formed in the bottom of the furnace body at the ash discharging layer; a feeding device is arranged at the upper part of the material storage layer in a matching manner; an ash accumulating device and a spiral-stirring ash discharging device are arranged at the lower part of the ash discharging layer; and a movable grate is arranged at the bottom of the combustion layer and comprises **multiple** rows of grate units arranged in the furnace body. According to the **biomass** gasifier, the slag is effectively discharged so as to guarantee the normal running of the **biomass** gasifier, and sufficient gas sources are supplied so as to avoid the existing phenomenon of gas cutoff or weak gas, so that the market competitiveness of the **biomass** gasifier is greatly improved.

12/39 © EPODOC / EPO

- PN - [CN103305285](#) A 20130918
- PNFP - CN103305285B B 20141015
- PR - CN20131237376 20130617
- AP - CN20131237376 20130617
- DT - I
- CT - || STSE (A)
[CN203307297U](#) U 20131127 [R] (UNIV SOUTHEAST)
[R] 1
权利要求1
[CN1754945](#) A 20060405 [A] (INST ENG THERMOPHYSICS CAS [CN])
[A] 1-4
具体实施方式及图1-3
[CN102517089](#) A 20120627 [A] (UNIV SOUTHEAST)
[A] 1-4
说明书实施例及图1

	CN102977927 A 20130320 [A] (UNIV SOUTHEAST) [A] 1-4 具体实施方式及图1 WO2010124077 A2 20101028 [A] (RANGE FUELS INC [US], et al) [A] 1-4 说明书第35-106段
PA	- (A) UNIVSOUTHEAST
TI	- (A) Device and method for preparing low-tar high-heat-value combustible gas by three-section-type gasification of biomass
AB	- (A) The invention discloses a device and a method for preparing a low-tar high-heat-value combustible gas by three-section-type gasification of biomass . The device consists of a fluidized bed gasification reactor, a cyclone reforming reactor, a mobile bed catalytic reactor and a return feeder, wherein the upper end of the fluidized bed gasification reactor is communicated with the upper part of the cyclone reforming reactor; the lower part of the fluidized bed gasification reactor is communicated with the lower part of the mobile bed catalytic reactor through the return feeder; the top of the cyclone reforming reactor is communicated with the top of the mobile bed catalytic reactor; the lower part of the fluidized bed gasification reactor is also provided with a biomass particle feeding port and a first oxygen enrichment/water steam inlet; the upper part of the cyclone reforming reactor is provided with a second oxygen enrichment/water steam inlet; the bottom of the return feeder is provided with a third oxygen enrichment/water steam inlet. The device and the method for preparing the low-tar high-heat-value combustible gas by three-section-type gasification of the biomass can effectively solve the problems that at present, a biomass gasification technology is low in gas production heat value and is high in tar concentration, and can be used for preparing multiple high-quality combustible gases which can be directly applied to fuel gas devices. The system can run in a self-heating-type; the gasification cost is low; the energy utilization ratio is high.
13/39	© EPODOC / EPO
PN	- CN103146432 A 20130612
PNFP	- CN103146432B B 20140507
PR	- CN2013186428 20130318
AP	- CN2013186428 20130318
DT	- I
CT	- STSE (A) CN102154031 A 20110817 [A] (UNIV NORTH CHINA ELEC POWER) [A] 1-7 * 全文 *; CN101880552 A 20101110 [A] (GUANGZHOU INST ENERGY CONV CAS) [A] 1-7 * 全文 *; CN202543155U U 20121121 [A] (UNIV NORTH CHINA ELEC POWER) [A] 1-7 * 全文 *; US5403366 A 19950404 [A] (LEININGER THOMAS F [US], et al) [A] 1-7 * 全文 *; WO2012059019 A1 20120510 [A] (GUANGZHOU DEVOTION THERMAL TEC [CN], et al)

	[A] 1-7 * 全文 *; US2010224835 A1 20100909 [A] (CHORNET ESTEBAN [CA], et al) [A] 1-7 * 全文 *; CN1435369 A 20030813 [A] (GUANGZHOU INST ENERGY CONV CAS [CN]) [A] 1-7 * 全文 *; CN102356143 A 20120215 [A] (ENERKEM INC) [A] 1-7 * 全文 *
CTNP	- STSE (A) [A] - 安璐等, "生物质快速裂解油蒸汽催化重整制氢研究进展", 《太阳能学报》, (20080630), vol. 29, no. 6, pages 745 - 750, [A] 1-7 * 第745-750页 * [A] - 陆强等, "生物质快速热解制备液体燃料", 《化学进展》, (20070831), vol. 19, no. 2, pages 1064 - 1071, [A] 1-7 * 第1064-1071页 *
CCA	- Y02P20/584 ; Y02P20/52
PA	- (A B) UNIV NORTH CHINA ELEC POWER
TI	- (A B) Biomass pyrolysis gasification and tar catalytic cracking device and method
AB	- (A) The invention discloses a biomass pyrolysis gasification and tar catalytic cracking device and method and belongs to the technical field of biomass energy utilization. The device comprises a hopper, a feeding system, a biomass pyrolysis gasification system, a tar catalytic cracking system, a fluidized bed coke combustion system, a hot sand separation system, a fluidized bed catalyst regeneration system and a catalyst separation system, wherien the biomass pyrolysis gasification system comprises multiple cyclone reaction separators and is used for obtaining hydrogen-enriched synthesis gas through a high-efficiency gasification reaction of the biomass raw materials under the gasification medium and fully reacting the biomass raw materials; and in addition, the tar catalytic cracking system comprises multiple cyclone reaction separators and is used for performing high-efficiency tar catalytic cracking, so that the tar is fully reacted so as to obtain hydrogen-enriched synthesis gas with extremely low tar content, and the inactivated catalyst is timely discharged out of the catalytic reaction system. According to the device, due to the introduction of the multi-stage cyclone reaction separators, and high-efficiency biomass gasification and high-efficiency tar conversion can be realized, so that the hydrogen-enriched synthesis gas with the low tar content is obtained.
14/39	© EPODOC / EPO
PN	- CN102944060 A 20130227
PR	- CN20121468365 20121116
AP	- CN20121468365 20121116
DT	- I
CT	- STSE (A) CN101737946 A 20100616 [A] (CHONGQING TUTORIAL INDUSTRY AN) [A] 1-3

全文

[CN2418354Y](#) Y 20010207 [Y] (SUIHUA FORESTRY MACHINEVY FACT [CN])

[Y] 1-3

说明书第2页第1行-第27行,图1

[CN101793433](#) A 20100804 [A] (CHENZHOU ZIRANREN THERMAL EQUIPMENT CO LTD)

[A] 1-3

全文

[CN201196415Y](#) Y 20090218 [Y] (SHIJIAZHUANG DEBAO MACHINERY M [CN])

[Y] 2

说明书第2页倒数第8行-第3页第6行,图1

[CN1129795](#) A 19960828 [Y] (CHINA AGRICULTURAL MACHINERY S [CN])

[Y] 1-3

说明书第1页第9行-第3页第24行,图1-4

PA - UNIV HUNAN HUMANITIES SCI & TECH

TI - **Biomass gasification** hot air device

AB - The invention discloses a **biomass gasification** hot air device. A gas outlet of a **gasification** furnace (1) is connected with a gas pipe (10) of a burner (3) through a gas delivery pipe (2); a contraction opening (13) of the burner (3) is connected with a burner nozzle (6) on a heat exchange box (5) through a hot gas output pipe (4); or a gas outlet end of the **biomass gasification** furnace (1) is connected with a smoke inlet pipe of a smoke assistant burner (3a) through the gas delivery pipe (2); and a discharge pipe of the smoke assistant burner (3a) is connected with the burner nozzle (6) on the heat exchange box (5) through the hot gas output pipe (4). The hot air device has **multiple** purposes and strong practical applicability, can provide clean and pollution-free heat energy for users, and has promotion value.

15/39 © EPODOC / EPO

PN - [CN202595059U](#) U 20121212

PR - CN20122147808U 20120410

AP - CN20122147808U 20120410

DT - I

PA - YONGQING ZHONGXI PHOTOELECTRIC TECHNOLOGY DEV CO LTD

TI - Steam injection device of **biomass** gasifier

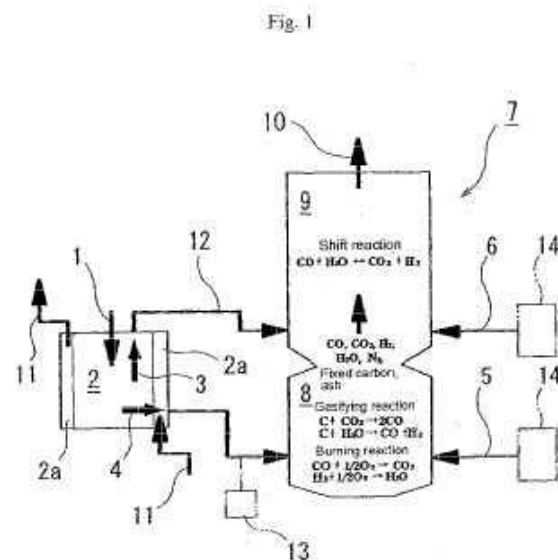
AB - The utility model discloses a steam injection device of a **biomass** gasifier. The steam injection device of the **biomass** gasifier comprises an upper hanging plate, a lower hanging plate, a steam pipeline and steam nozzles communicated with the steam pipeline, wherein the upper hanging plate and the lower hanging plate are equal in size and same in structure, and both the upper hanging plate and the lower hanging plate are circular plates. Material falling holes are evenly arranged on the circular plates, the lower hanging plate is fixedly mounted, the upper hanging plate is connected with a turning handle, the upper hanging plate is enabled to rotate freely in a 36-degree range, and the **multiple** steam nozzles and **multiple** temperature controlling probes are arranged on the bottom face of the upper hanging plate and above the lower hanging plate. The steam injection device of the **biomass** gasifier is mounted in a downdraft gasifier and used to inject steam into the **biomass** gasifier in the straw combustion and **gasification** process, since a temperature controlling device is arranged in the steam injection device of the **biomass** gasifier, the effect that a certain amount of the steam can be injected into the **biomass** gasifier when a preset temperature is achieved, the steam injection device of the **biomass** gasifier is simple and convenient to operate, and the steam injection device of the **biomass** gasifier can be practically used in the operation of a straw gasifier.

16/39 © EPODOC / EPO

- PN - [CN102703122](#) A 20121003
- PR - CN20121169726 20120529
- AP - CN20121169726 20120529
- DT - I
- CT - || STSE (A)
[CN202558816U](#) U 20121128 [R] (SHANDONG CHANGTAI MACHINERY MANUFACTURE CO LTD)
[R] 1-2
权利要求1-2
[CN2677377Y](#) Y 20050209 [A] (UNIV JIANGSU [CN])
[A] 1-2
权利要求1-2
[CN201318688Y](#) Y 20090930 [A] (WENXIANG YU [CN])
[A] 1-2
权利要求1-3
- CCA - [Y02P20/124](#)
- PA - SHANDONG CHANGTAI MACHINERY MFG CO LTD
- TI - **Biomass gasification** unit
- AB - The invention discloses a **biomass gasification** unit which comprises a hay cutter (1), a closed conveyor (2), a **gasification** furnace (3), a purifier (4), an oil-gas separator (5), a Roots fan (6), a pressure adjusting bypass (7), a cyclone tar collecting device (8), a backflow pipe (9), a safe water seal (10), a wet gas holder (11), an emptying pipe (12), a flame arrester (13) and a user air supply pipe (14). The **biomass gasification** unit has the beneficial effects of running under a complete closed state during the processes from the preliminary processing of **biomass** to be used by the user, so that the environment pollution is avoided, due to layer-upon-layer purification, the gas purity is higher, the tar content is reduced to minimum, and the burning heat value approaches to a straw theoretic calorific value; and the **biomass gasification** unit is simple and convenient in operation, safe, environment-friendly, economic, energy-conservation and high-efficiency, and is suitable for concentrated air supply for **multiple** users.

17/39 © EPODOC / EPO

- PN - [TW201207098](#) A 20120216
- PR - JP20040085108
20040323; JP20040180122 20040617
- AP - TW20110133319 20050323
- DT - I
- CCI - [C10J3/66](#) ; [C10J3/721](#) ; [C10J3/78](#) ;
[C10K3/006](#) ; [C10K3/04](#)
- CCA - [Y02E20/12](#) ; [C10J2300/0916](#) ;
[C10J2300/094](#) ; [C10J2300/0946](#) ;
[C10J2300/0956](#) ; [C10J2300/165](#) ;
[C10J2300/1671](#)
- PA - CENTRAL RES INST ELECT [JP]; KANAI
OFFICE CORP [JP]
- TI - Carbonization and **gasification** of **biomass**
and power generation system
- AB - **Biomass**, including waste **biomass**, is
gasified by a process in which
the **biomass** is first carbonized, and the



char and pyrolysis gas from the carbonizer are respectively fed to a high temperature gasifying part and a gas reformer part of a two-stage gasifier. A gasifying agent is continuously fed to the gasifying part, and intermittently fed to the gas reformer, to maintain the temperature required to avoid tar formation in the gas reformer stage. **Multiple** carbonization chambers are operated in rotation. When the carbonization/ **gasification** apparatus is used to provide fuel to an electric power generator set, exhaust heat from the generator power plant is fed back to the carbonizer, and can be supplemented by exchange of heat from the gas delivered to generator power plant from the outlet of the gasifier.

18/39 © EPODOC / EPO

- PN - [CN202379956U](#) U 20120815
- PR - CN20112530854U 20111219
- AP - CN20112530854U 20111219
- DT - I
- CCA - [Y02B30/625](#) ; [Y02A30/274](#)
- PA - HENAN ACADEMY SCIENCES ENERGY RES INST CO LTD; HENAN BIOMASS ENERGY KEY LAB
- TI - Combined cooling, heating and power system for **biomass**
- AB - The utility model belongs to the technical field of energy utilization of **biomass**, in particular to a combined cooling, heating and power system for the **biomass**. The combined cooling, heating and power system comprises a **biomass gasification** furnace, wherein the fuel gas outlet of the **biomass gasification** furnace is connected with a first dust removing device; the fuel gas outlet of the first dust removing device is connected with a decoking device; and the fuel gas outlet of the decoking device is connected with a gas power generator. During the work of the combined cooling, heating and power system, the **biomass** is pyrolyzed and gasified to generate **biomass** gas which is mainly used for power generation while the other part is used for combustion to obtain high-temperature flue gas to heating of the decoking device; and the flue gas generated after fuel gas power generation and the flue gas generated after heating and dust removing are used in a single/double effect lithium bromide chiller-heater, so as to obtain electricity, cold quantity and heat quantity. Therefore, energy stepped utilization is realized; the requirements for **multiple** types of energies are met; and the **biomass** energy is utilized completely.

19/39 © EPODOC / EPO

- PN - [CN102604679](#) A 20120725
- PNFP - CN102604679B B 20131023
- PR - CN2012178963 20120323
- AP - CN2012178963 20120323
- DT - I

CT	- STSE (A) CN102344835 A 20120208 [Y] (UNIV NANJING FORESTRY) [Y] 1-4 * 说明书第5、9-11段及附图1 *; CN2459549Y Y 20011114 [Y] (ZHANG YONGMING [CN]) [Y] 1-4 * 说明书第1页第5段至第2页倒数第2段及附图1 *; CN2512987Y Y 20020925 [Y] (PINGLIANG CITY GAS CO [CN]) [Y] 1-4 * 说明书第3页倒数第1段至第5页倒数第2段及附图1-3 *; CN201497315U U 20100602 [A] (QINGGUO ZHANG) [A] 1-4 * 说明书第4、16-21段及附图1-2 *; US4498909 A 19850212 [A] (MILNER GEOFFREY [GB], et al) [A] 1-4 * 说明书第5栏第2段至第8栏第1段及附图1-2 *
PA	- (A B) UNIV NANJING FORESTRY
TI	- (A B) Agroforestral biomass gasification furnace adapted to multiple raw materials
AB	- (A) The invention discloses an agroforestral biomass gasifying furnace adapted to multiple raw materials, which comprises a rotary poking device, a hydraulic poking elevator and a feeding inlet which are arranged on the top part of a gasifying furnace, wherein a gasifying reaction chamber is arranged in the cavity of the gasifying furnace; the gasifying reaction chamber is divided downwards into a preheating dry chamber, an oxidizing reaction chamber, and a reducing reaction; the middle-lower part of a furnace body is provided with an automatically-overturned grate which is transmitted on the exterior of the furnace body; and the bottom part of the furnace body is provided with a continuously rotary carbon discharging device. The gasifying furnace disclosed by The invention has advantages that hub-shaped material is reacted in the gasifying furnace so as to discharge the carbon continuously; the grate is rotated so that all casting-iron finned tubes are arranged horizontally; rice-hull-shaped light-small material is reacted in the gasifying furnace; casting-iron tubes are rotated timely so as to discharge material discontinuously; the bottom of the gasifying furnace is provided with a conically rotary device with a poking sheet and a poking nail; in a rotating procedure, the poking sheet is rotated so that the gasifying furnace discharges the material evenly; the poking nail prevents the gasifying furnace from being bridged in a cone shape; the gasifying furnace realizes a purpose that multiple raw materials use a same type of furnaces; the furnace body can be enlarged through measure disclosed by The invention; gas production quantity of the single furnace is increased; and the agroforestral biomass gasifying furnace is adapted to multiple raw materials and realizes industrialization and scale production.

PN - [US2012145965](#) A1 20120614

PNFP - US9011560 B2 20150421

PR - US201013254020
20101208; US20100795947
20100608; US20100380116P
20100903; US20090248282P
20091002; US20090185492P
20090609; WO2010US59564 20101208

AP - US201013254020 20101208

DT - **

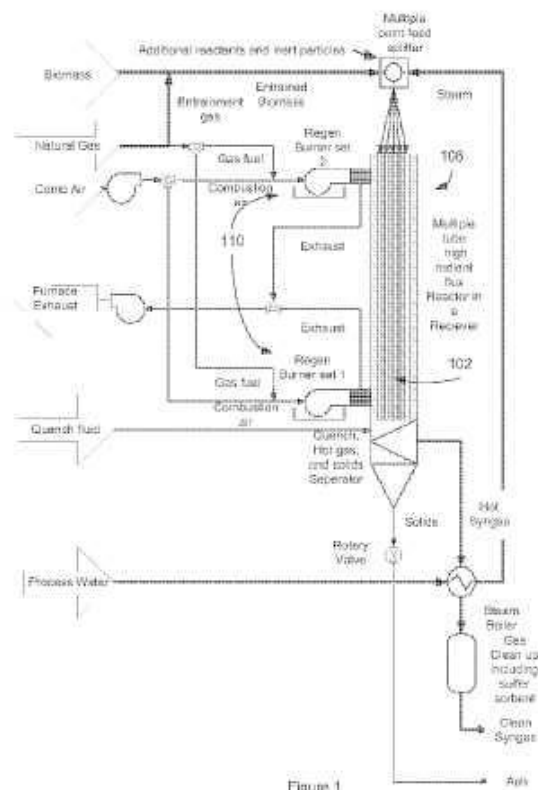
CT - || STSE (B2)
[US2008086946](#) A1 20080417 [
] (WEIMER ALAN W [US], et al)
- || R141 (A1)
[US2008086946](#) A1 []

CCI - [C01B3/24](#) ; [C01B3/34](#) ; [C07C29/152](#) ;
[C10J3/485](#) ; [C10J3/506](#) ; [C10J3/84](#)

CLC - [C07C29/152](#) , [C07C31/04](#) , INV

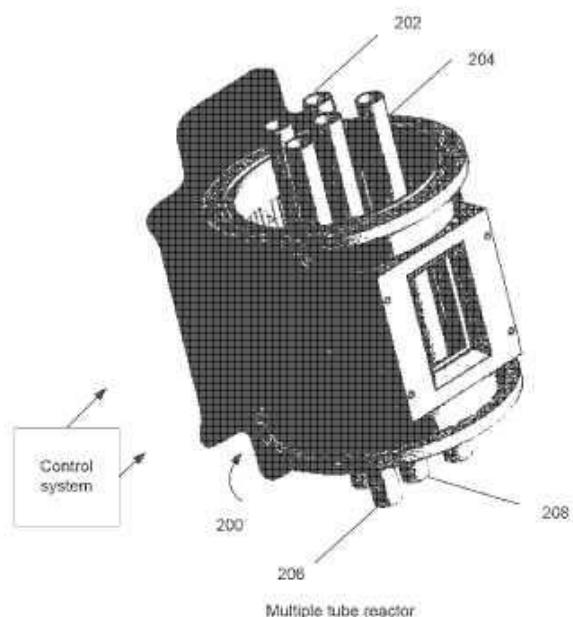
CCA - [Y02E50/18](#) ; [C01B2203/0216](#) ;
[C01B2203/0222](#) ; [C01B2203/0272](#) ;
[C01B2203/0485](#) ; [C01B2203/0495](#) ;
[C01B2203/061](#) ; [C01B2203/062](#) ;
[C01B2203/0816](#) ; [C01B2203/0822](#) ;
[C01B2203/0877](#) ; [C01B2203/0894](#) ;
[C01B2203/1241](#) ; [C10G2300/1011](#) ;
[C10G2400/02](#) ; [C10J2300/0906](#) ;
[C10J2300/0909](#) ; [C10J2300/0916](#) ;
[C10J2300/0976](#) ; [C10J2300/0989](#) ;
[C10J2300/1223](#) ; [C10J2300/1246](#) ;
[C10J2300/1269](#) ; [C10J2300/1292](#) ;
[C10J2300/1621](#) ; [C10J2300/1665](#) ;
[C10J2300/1687](#) ; [C10J2300/1693](#) ;
[C10J2300/1884](#) ; [C10J2300/1892](#) ;
[F28D2021/0022](#) ; [C10J2200/152](#) ;
[C10G2300/807](#) ; [Y02P20/134](#) ;
[Y02P20/145](#) ; [Y02P20/129](#) ;
[Y02P20/128](#) ; [Y02P30/20](#)

PA - (A1)
SIMMONS WAYNE W [US]; PERKINS
CHRISTOPHER [US]; JOVANIC ZORAN [US];
HILTON COURTLAND M [US]; POP PETER
[US]; SCHRAMM BRYAN J [US]; TURNER
JOHN T [US]; SUNDROP FUELS INC [US]
- (B2)
SIMMONS WAYNE W [US]; PERKINS
CHRISTOPHER [US]; JOVANOVIĆ ZORAN
[US]; HILTON COURTLAND M [US]; POPP
PETER [US]; SCHRAMM BRYAN J [US];
TURNER JOHN T [US]; SUNDROP FUELS INC
[US]



- TI - (A1 B2)
VARIOUS METHODS AND APPARATUSES
FOR AN ULTRA-HIGH HEAT FLUX CHEMICAL
REACTOR
- AB - (A1 B2)
Various processes and apparatus are
discussed for an ultra-high heat flux
chemical reactor. A thermal receiver and
the reactor tubes are aligned to 1)
absorb and re-emit radiant energy, 2)
highly reflect radiant energy, and 3) any
combination of these, to maintain an
operational temperature of the enclosed
ultra-high heat flux chemical reactor.
Particles of **biomass** are gasified in the
presence of a steam carrier gas and
methane in a simultaneous steam
reformation and steam **biomass**
gasification reaction to produce reaction
products that include hydrogen and
carbon monoxide gas using the ultra-
high heat flux thermal energy radiated
from the inner wall and then into
the **multiple** reactor tubes. The **multiple**
reactor tubes and cavity walls of the
receiver transfer energy primarily by
radiation absorption and re-radiation,
rather than by convection or conduction,
to the reactants in the chemical reaction
to drive the endothermic chemical
reaction flowing in the reactor tubes.

- 21/39 © EPODOC / EPO
- PN - [CN102459527](#) A 20120516
- PR - WO2010US37938
20100609; US20090185492P
20090609; US20090248282P
20091002; US20100795910 20100608
- AP - CN2010824924 20100609
- DT - I
- CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)
- CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)



CLC	- C07C29/15 , C07C31/04 , INV - C07C29/1518 , C07C31/04 , INV
CCA	- C10L2290/04 ; C10L2290/42 ; Y02T50/678 ; Y02E10/41 ; Y02E50/18 ; Y02E50/32 ; C10L2290/02 ; C10L2290/06 ; C01B2203/0216 ; C01B2203/061 ; C01B2203/84 ; C10G2300/1014 ; C10G2300/1025 ; C10J2300/0906 ; C10J2300/0909 ; C10J2300/0916 ; C10J2300/0973 ; C10J2300/0989 ; C10J2300/1284 ; C10J2300/1292 ; C10J2300/1621 ; C10J2300/1659 ; C10J2300/1665 ; C10J2300/1693 ; C10L2200/0492 ; C10L2290/547 ; C10J2200/09 ; C10L2290/08 ; C10L2290/28 ; C10G2300/807 ; C10L2290/52 ; C10L2290/50 ; Y02P20/134 ; Y02P20/145 ; Y02P20/129 ; Y02P30/20 ; Y02P20/136
CUA	- C10J2200/15 ; B01J2219/00117 ; B01J2219/00186 ; C01B2203/0233 ; C01B2203/0811 ; C01B2203/1241 ; C01B2203/1685 ; C10J2300/094 ; C10J2300/0976 ; C10J2300/0993 ; C10J2300/1223 ; C10J2300/123 ; C10J2300/1853 ; C10J2300/1861 ; C10J2200/158
CQA	- Y02B40/18
PA	- SUNDROP FUELS INC
TI	- Systems and methods for biomass gasifier reactor and receiver configuration
AB	- A method, apparatus, and system for solar-driven chemical plant may include a solar thermal receiver to absorb concentrated solar energy from an array of heliostats. Additionally, some embodiments may include a solar driven chemical reactor that has multiple reactor tubes. The concentrated solar energy drives the endothermic gasification reaction of the particles of biomass flowing through the reactor tubes. Some embodiments may also include an on-site fuel synthesis reactor that is geographically located on the same site as the chemical reactor and integrated to receive the hydrogen and carbon monoxide products from the gasification reaction.

PN - [CN102405379](#) A 20120404

PR - WO2010US37911
20100609; US20090185492P
20090609; US20090248282P
20091002; US20100796045 20100608

AP - CN2010817429 20100609

DT - I

CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)

CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)

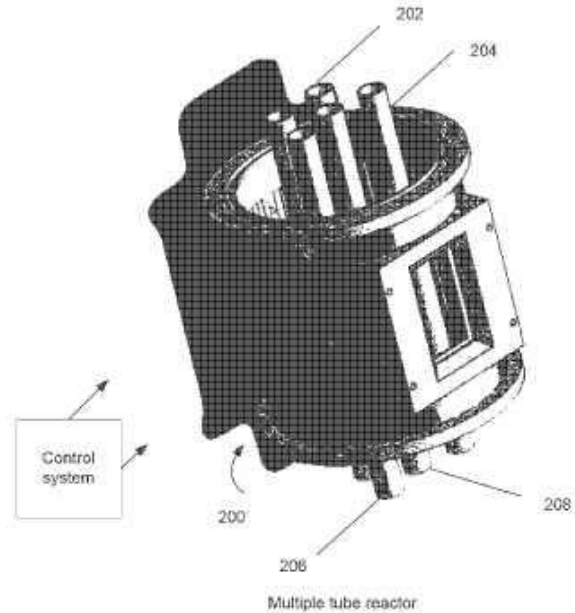
CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV

CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;
[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
[C01B2203/061](#) ; [C01B2203/84](#) ;
[C10G2300/1014](#) ; [C10G2300/1025](#) ;
[C10J2300/0906](#) ; [C10J2300/0909](#) ;
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[C10L2290/547](#) ; [C10J2200/09](#) ;
[C10L2290/08](#) ; [C10L2290/28](#) ;
[C10G2300/807](#) ; [C10L2290/52](#) ;
[C10L2290/50](#) ; [Y02P20/134](#) ;
[Y02P20/145](#) ; [Y02P20/129](#) ; [Y02P30/20](#) ;
[Y02P20/136](#)

CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
[B01J2219/00186](#) ; [C01B2203/0233](#) ;
[C01B2203/0811](#) ; [C01B2203/1241](#) ;
[C01B2203/1685](#) ; [C10J2300/094](#) ;
[C10J2300/0976](#) ; [C10J2300/0993](#) ;
[C10J2300/1223](#) ; [C10J2300/123](#) ;
[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)

CQA - [Y02B40/18](#)

PA - SUNDROP FUELS INC



- TI - Systems and methods for solar-thermal **gasification** of **biomass**
- AB - A method, apparatus, and system for a solar-driven chemical plant that may include a solar thermal receiver having a cavity with an inner wall, where the solar thermal receiver is aligned to absorb concentrated solar energy from one or more of 1) an array of heliostats, 2) solar concentrating dishes, and 3) any combination of the two.; Some embodiments may include a solar-driven chemical reactor having **multiple** reactor tubes located inside the cavity of solar thermal receiver, wherein a chemical reaction driven by radiant heat occurs in the **multiple** reactor tubes, and wherein particles of **biomass** are gasified in the presence of a steam (H₂O) carrier gas and methane (CH₄) in a simultaneous steam reformation and steam **biomass gasification** reaction to produce reaction products that include hydrogen and carbon monoxide gas using the solar thermal energy from the absorbed concentrated solar energy in the **multiple** reactor tubes.

23/39 © EPODOC / EPO

PN - [AU2010258855](#) A1 20110901

PR - US20100795910
20100608; US20090248282P
20091002; US20090185492P
20090609; WO2010US37938 20100609

AP - AU20100258855 20100609

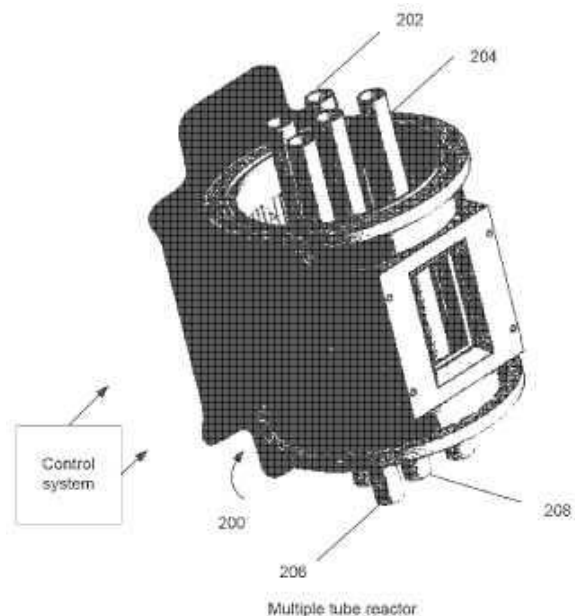
DT - I

CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)

CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)

CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV

CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;



[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
[C01B2203/061](#) ; [C01B2203/84](#) ;
[C10G2300/1014](#) ; [C10G2300/1025](#) ;
[C10J2300/0906](#) ; [C10J2300/0909](#) ;
[C10J2300/0916](#) ; [C10J2300/0973](#) ;
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[C10J2300/1292](#) ; [C10J2300/1621](#) ;
[C10J2300/1659](#) ; [C10J2300/1665](#) ;
[C10J2300/1693](#) ; [C10L2200/0492](#) ;
[C10L2290/547](#) ; [C10J2200/09](#) ;
[C10L2290/08](#) ; [C10L2290/28](#) ;
[C10G2300/807](#) ; [C10L2290/52](#) ;
[C10L2290/50](#) ; [Y02P20/134](#) ;
[Y02P20/145](#) ; [Y02P20/129](#) ; [Y02P30/20](#) ;
[Y02P20/136](#)

- CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
[B01J2219/00186](#) ; [C01B2203/0233](#) ;
[C01B2203/0811](#) ; [C01B2203/1241](#) ;
[C01B2203/1685](#) ; [C10J2300/094](#) ;
[C10J2300/0976](#) ; [C10J2300/0993](#) ;
[C10J2300/1223](#) ; [C10J2300/123](#) ;
[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)
- CQA - [Y02B40/18](#)
- PA - SUNDROP FUELS INC
- TI - Systems and methods for **biomass**
gasifier reactor and receiver
configuration
- AB - A method, apparatus, and system for
solar-driven chemical plant may include
a solar thermal receiver to absorb
concentrated solar energy from an array
of heliostats. Additionally, some
embodiments may include a solar driven
chemical reactor that has **multiple**
reactor tubes. The concentrated solar
energy drives the
endothermic **gasification** reaction of the
particles of **biomass** flowing through the
reactor tubes. Some embodiments may
also include an on-site fuel synthesis
reactor that is geographically located on
the same site as the chemical reactor
and integrated to receive the hydrogen
and carbon monoxide products from
the **gasification** reaction.

PN - [AU2010258840](#) A1 20110901

PNFP - AU2010258840B B2 20151001

PR - US20090185492P
20090609; US20090248282P
20091002; US20100796045
20100608; WO2010US37911 20100609

AP - AU20100258840 20100609

DT - I

CT - || STSE (B2)
[US2003208959](#) A1 20031113 [
] (WEIMER ALAN W [US], et al);
[US4552741](#) A 19851112 [] (MELCHIOR
ECKHARD [DE]);
[US2008086946](#) A1 20080417 [
] (WEIMER ALAN W [US], et al)

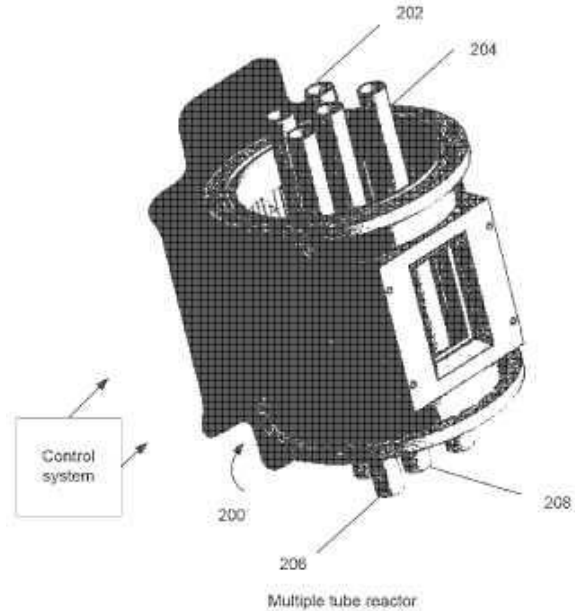
CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)

CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)

CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV

CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;
[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
[C01B2203/061](#) ; [C01B2203/84](#) ;
[C10G2300/1014](#) ; [C10G2300/1025](#) ;
[C10J2300/0906](#) ; [C10J2300/0909](#) ;
[C10J2300/0916](#) ; [C10J2300/0973](#) ;
[C10J2300/0989](#) ; [C10J2300/1284](#) ;
[C10J2300/1292](#) ; [C10J2300/1621](#) ;
[C10J2300/1659](#) ; [C10J2300/1665](#) ;
[C10J2300/1693](#) ; [C10L2200/0492](#) ;
[C10L2290/547](#) ; [C10J2200/09](#) ;
[C10L2290/08](#) ; [C10L2290/28](#) ;
[C10G2300/807](#) ; [C10L2290/52](#) ;
[C10L2290/50](#) ; [Y02P20/134](#) ;
[Y02P20/145](#) ; [Y02P20/129](#) ; [Y02P30/20](#) ;
[Y02P20/136](#)

CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
[B01J2219/00186](#) ; [C01B2203/0233](#) ;
[C01B2203/0811](#) ; [C01B2203/1241](#) ;
[C01B2203/1685](#) ; [C10J2300/094](#) ;



[C10J2300/0976](#) ; [C10J2300/0993](#) ;
[C10J2300/1223](#) ; [C10J2300/123](#) ;
[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)

- CQA - [Y02B40/18](#)
- PA - (A1 B2)
SUNDROP FUELS INC
- TI - (A1 B2)
Systems and methods for solar-thermal **gasification** of **biomass**
- AB - (A1 B2)
A method, apparatus, and system for a solar-driven chemical plant that may include a solar thermal receiver having a cavity with an inner wall, where the solar thermal receiver is aligned to absorb concentrated solar energy from one or more of 1) an array of heliostats, 2) solar concentrating dishes, and 3) any combination of the two. Some embodiments may include a solar-driven chemical reactor having **multiple** reactor tubes located inside the cavity of solar thermal receiver, wherein a chemical reaction driven by radiant heat occurs in the **multiple** reactor tubes, and wherein particles of **biomass** are gasified in the presence of a steam (H₂O) carrier gas and methane (CH₄) in a simultaneous steam reformation and steam **biomass gasification** reaction to produce reaction products that include hydrogen and carbon monoxide gas using the solar thermal energy from the absorbed concentrated solar energy in the **multiple** reactor tubes.

25/39 © EPODOC / EPO

- PN - [CN102260537](#) A 20111130
- PNFP - CN102260537B B 20140122
- PR - CN20111154774 20110610
- AP - CN20111154774 20110610
- DT - I
- CT - || STSE (A)
[WO2006081661](#) A1 20060810 [A] (PLASCO ENERGY GROUP INC [CA], et al)
[A] 1-21
[CN1858156](#) A 20061108 [A] (ZHANG YULIANG [CN])
[A] 1-21
[CN101427073](#) A 20090506 [A] (PEAT INTERNAT INC [US])
[A] 1-21

	US4508040 A 19850402 [A] (SANTEN SVEN [SE], et al) [A] 1-21 CN201421097Y Y 20100310 [A] (XUEFENG ZHANG) [A] 1-23 CN201144219Y Y 20081105 [A] (KAIGEN ZHOU [CN]) [A] 1-23 CN1821054 A 20060823 [A] (ZHOU KAIGEN [CN]) [A] 1-23 CN2593067Y Y 20031217 [A] (GUANGZHOU ENERGY INST CHINESE [CN]) [A] 1-23 CN101671578 A 20100317 [Y] (WUHAN KAIDI HOLDING INVEST CO) [Y] 1-23 CN1208433 A 19990217 [A] (EVGENY I KARPENKO [RU]) [A] 1-23 CN1420155 A 20030528 [Y] (GUNANGZHOU INST OF ENERGY CONV [CN]) [Y] 1-23
CTNP	- STSE (A) [] 唐兰,黄海涛, "生物质在高频耦合等离子体中的热解气化研究", <<可再生能源>>, (20050330), no. 3 [] 李松栋等, "煤在新型等离子体反应器内的气化", <<太原理工大学学报>>, (20040930), vol. 35, no. 5 [Y] "变压吸附:原理和过程", R.T.杨, <<吸附法气体分离>>, PAGE 246-248 [Y] 6 第246-248页
PA	- (B) SUN SHINE KAI DI NEW ENERGY GROUP CO LTD
TI	- (B) Device for preparing combustible gas by virtue of plasma pyrolysis and oxygen-enriched combustion-supporting material
AB	- (A) The invention relates to the technical field of combustible gas preparation by virtue of biomass pyrolysis and gasification and further relates to the clean energy field of combustible gas preparation by virtue of pyrolysis and gasification of waste polymer compounds. The device consists of a gasification furnace, a plasma generation device, an oxygen-enriched combustion-supporting device, a biomass transporting device, a cyclone separation conveying device, a steam generation device, an air blower and a slag processing device, wherein the plasma generation device, an oxygen-enriched combustion-supporting pyrolysis region, a steam-adding thermalization reaction region and a second cracking region are arranged in a gasifying hearth; and multiple operation and control means are set, thereby conveniently regulating and controlling the furnace temperatures of various functional regions in the furnace to the optimal temperatures for gasifying the biomass or polymer compounds. By using the device, the generation of tar and K and Na metal salt gases can be avoided, thus the device provided by the invention is a combustible gas preparing device capable of improving the gasifying efficiency and the product quality, reducing the energy consumption and prolonging the service life of equipment.
26/39	© EPODOC / EPO
PN	- CN202018064U U 20111026
PR	- CN2011276397U 20110322
AP	- CN2011276397U 20110322
DT	- I

PA - JINGXUAN XU

TI - Civil **gasification** furnace integrating heating and kang burning of cooking range

AB - The utility model discloses a civil **gasification** furnace integrating heating and kang burning of a cooking range, which relates to a **gasification** furnace, and is used for solving the problems of large amount of oil tar and waste water, peculiar smell, difficulty in discharging ash and residues, banking fire, igniting and operating, low gas production efficiency and low heat value of fuel gas. A coke button crusher is arranged above a fire grate on the lower part of a **gasification** reaction chamber, and is connected with a pull rod; a filtering adsorption reaction chamber is arranged on the middle part of a furnace body; **biomass** is arranged in the filtering adsorption reaction chamber; the filtering adsorption reaction chamber is provided with an air inlet and an air outlet; the air outlet is communicated with a combustion chamber; a smoke exhaust pipe is arranged between the **gasification** reaction chamber and the combustion chamber, and is provided with a valve body; a heated kang connecting pipe is arranged above the combustion chamber; and a hot water tank is provided with a water feeding pipe and a water return pipe which are connected with a radiator respectively. The civil **gasification** furnace has the advantages of high heat value, no emission of oil tar or waste water, no peculiar smell, no flue gas leakage during feeding, ash discharge and tar removing in a **gasification** combustion process, **multiple** functions and long fire banking time.

27/39 © EPODOC / EPO

PN - [CN201864700U](#) U 20110615

PR - CN20091207566 20091022; CN20102597845U 20101021

AP - CN20102597845U 20101021

DT - I

CCA - [Y02P20/13](#)

PA - SHANDONG BAICHUAN TONGCHUANG ENERGY CO LTD

TI - **Biomass gasification** reaction furnace

AB - The utility model belongs to the technical field of **biomass gasification** reaction equipment, in particular to a **biomass gasification** reaction furnace. The technical scheme includes that the **biomass gasification** reaction furnace comprises a furnace top, a furnace bosh, a firebox, a furnace bottom, fire grates, a fire grate rotating transmission device and a furnace bottom ash discharge sealing device, and the fire grates include at least two fire grates arranged in parallel. Ash is discharged by means of rotation of the fire grates, and slag crushing function is realized by means of rolling and squeezing. The **biomass gasification** reaction furnace is wide in gas production range, and can be used for **multiple** fields of power generation, heat supply, industrial application, cooking and the like.

28/39 © EPODOC / EPO

PN - [CN201737904U](#) U 20110209

PR - CN20102256404U 20100706

AP - CN20102256404U 20100706

DT - I

PA - SHANHUA LIU

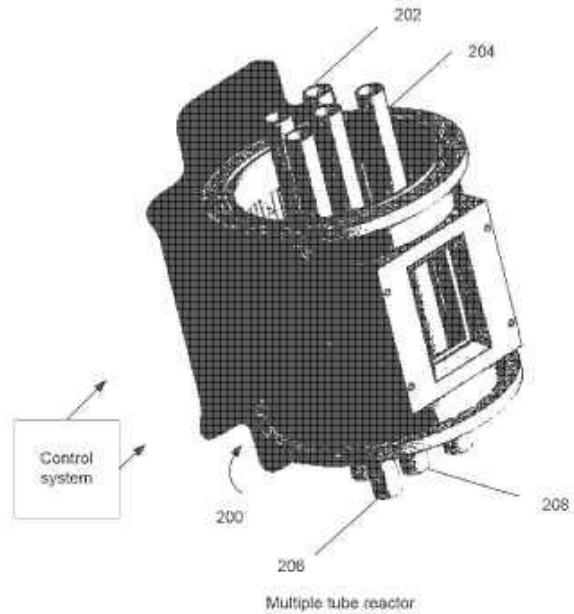
TI - **Biomass gasification** furnace utilizing mixture of steam and air medium

AB - A **biomass gasification** furnace utilizing a mixture of steam and air medium mainly comprises a **gasification** chamber, tar crackers, a combined dividing wall water tank, an air supply system and an ash disposal system, wherein the wall of the **gasification** chamber adopts a water tank type structure and is divided into a water tank upper body and a water tank lower body; one

side of the water tank upper body is provided with **multiple** high and low dividing wall water tanks; one tar cracker is arranged between every two adjacent dividing wall water tanks; one side of the water tank upper body of the **gasification** chamber, provided with the dividing wall water tanks, is provided with a gas outlet; the main body of the air supply system is an air supply pipe; one end of the air supply pipe is communicated with the cavity of the water tank upper body, while the other end is provided with an air supply barrel; and the air supply barrel is arranged in the **gasification** chamber. The **biomass gasification** furnace utilizing a mixture of steam and air medium indirectly lowers the temperature of the gas by adopting the water tanks of the **gasification** chamber and the combination of **multiple** layers of dividing wall water tanks; simultaneously, the mixture of wet steam and air serves as a **biomass gasification** agent; and the tar crackers are installed, therefore the tar is decomposed to permanent gas.

29/39 © EPODOC / EPO

- PN - [WO2010144552](#) A1 20101216
- PR - US20100795910
20100608; US20090185492P
20090609; US20090248282P 20091002
- AP - WO2010US37938 20100609
- DT - **
- CT - |US| ISR (A1)
[US2008086946](#) A1 20080417
[X] (WEIMER ALAN W [US], et al);
[US2007098602](#) A1 20070503
[Y] (HAUETER PHILIPP [CH], et al);
[US2004219079](#) A1 20041104 [Y] (HAGEN DAVID L [US], et al);
[US5906799](#) A 19990525 [Y] (BURGIE RICHARD ANTHONY [US], et al);
[US7207327](#) B2 20070424 [Y] (LITWIN ROBERT Z [US], et al);
[US5618500](#) A 19970408 [Y] (WANG CHI-SHANG [US])
- CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
[C10J3/485](#) ; [C10J3/723](#) ; [C10L1/04](#) ;
[C10G2/30](#) ; [C10G2/32](#) ; [C10G3/00](#) ;
[F24S20/20](#)
- CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
[B01J19/2445](#) ; [B01J19/245](#) ; [C01B3/384](#) ;
[C10J3/466](#) ; [C10J3/506](#) ; [C10J3/54](#) ;
[C10J3/56](#) ; [C10J3/58](#) ; [C10J3/60](#) ;
[C10J3/62](#) ; [C10J3/721](#) ; [C10J3/82](#) ;
[C10J3/84](#) ; [C10K1/024](#)
- CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV
- CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;
[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
[C01B2203/061](#) ; [C01B2203/84](#) ;



[C10G2300/1014](#) ; [C10G2300/1025](#) ;
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[Y02P20/145](#) ; [Y02P20/129](#) ; [Y02P30/20](#) ;
[Y02P20/136](#)

- CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
[B01J2219/00186](#) ; [C01B2203/0233](#) ;
[C01B2203/0811](#) ; [C01B2203/1241](#) ;
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[C10J2300/1223](#) ; [C10J2300/123](#) ;
[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)
- CQA - [Y02B40/18](#)
- PA - SUNDROP FUELS INC [US]
- TI - SYSTEMS AND METHODS FOR **BIOMASS**
GASIFIER REACTOR AND RECEIVER
CONFIGURATION
- AB - A method, apparatus, and system for
solar-driven chemical plant may include
a solar thermal receiver to absorb
concentrated solar energy from an array
of heliostats. Additionally, some
embodiments may include a solar driven
chemical reactor that has **multiple**
reactor tubes. The concentrated solar
energy drives the
endothermic **gasification** reaction of the
particles of **biomass** flowing through the
reactor tubes. Some embodiments may
also include an on-site fuel synthesis
reactor that is geographically located on
the same site as the chemical reactor
and integrated to receive the hydrogen
and carbon monoxide products from
the **gasification** reaction.

PN - [WO2010144537](#) A1 20101216

PNFP - WO2010144537 A9 20110203

PR - US20100796045
20100608; US20090248282P
20091002; US20090185492P 20090609

AP - WO2010US37911 20100609

DT - **

CT - |US| ISR (A1)
[US2008086946](#) A1 20080417 [Y] (WEIMER
ALAN W [US], et al);
[US4552741](#) A 19851112 [Y] (MELCHIOR
ECKHARD [DE]);
[US2003208959](#) A1 20031113 [Y] (WEIMER
ALAN W [US], et al)

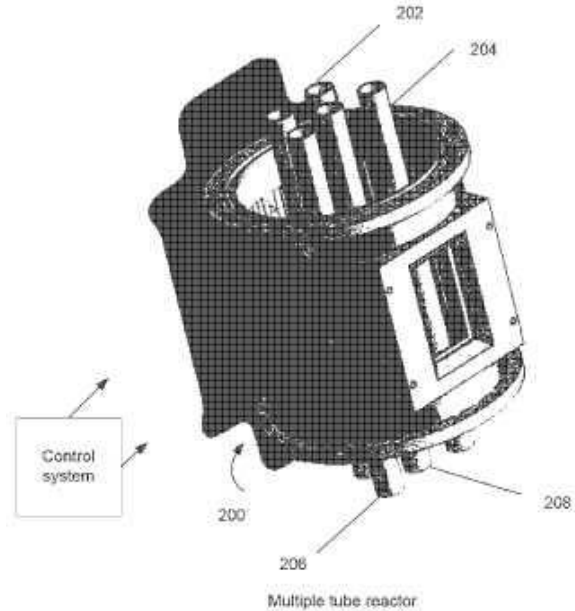
CTNP - |US| ISR (A1)
[A] - MISHRA ET AL., "Thermal optimization of
solar biomass hybrid cogeneration plants",
JOURNAL OF SCIENTIFIC & INDUSTRIAL
RESEARCH, (200604), vol. 65, pages 355 - 363
[A] - MUNZINGER ET AL., "Biomass
Gassification using Solar Thermal Energy",
ANZSES 2006, (2006), URL: <http://solar-thermal.anu.edu.au/wp-content/uploads/MunzingerSol06.pdf>,
(20100720)

CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
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[F24S20/20](#)

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[C10J3/506](#) ; [C10J3/54](#) ; [C10J3/56](#) ; [C10J3/58](#) ;
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[C10J3/84](#) ; [C10K1/024](#)

CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV

CCA - [C10L2290/04](#) ; [C10L2290/42](#) ; [Y02T50/678](#) ;
[Y02E10/41](#) ; [Y02E50/18](#) ; [Y02E50/32](#) ;
[C10L2290/02](#) ; [C10L2290/06](#) ;
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- [C10G2300/807](#) ; [C10L2290/52](#) ;
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[C01B2203/1685](#) ; [C10J2300/094](#) ;
[C10J2300/0976](#) ; [C10J2300/0993](#) ;
[C10J2300/1223](#) ; [C10J2300/123](#) ;
[C10J2300/1853](#) ; [C10J2300/1861](#) ;
[C10J2200/158](#)
- CQA - [Y02B40/18](#)
- PA - (A1 A9)
SUNDROP FUELS INC [US]; SIMMONS WAYNE
[US]; PERKINS CHRISTOPHER [US]; JOVANIC
ZORAN [US]
- TI - (A1 A9)
SYSTEMS AND METHODS FOR SOLAR-
THERMAL **GASIFICATION OF BIOMASS**
- AB - (A1 A9)
A method, apparatus, and system for a solar-
driven chemical plant that may include a
solar thermal receiver having a cavity with an
inner wall, where the solar thermal receiver is
aligned to absorb concentrated solar energy
from one or more of 1) an array of heliostats,
2) solar concentrating dishes, and 3) any
combination of the two. Some embodiments
may include a solar-driven chemical reactor
having **multiple** reactor tubes located inside
the cavity of solar thermal receiver, wherein a
chemical reaction driven by radiant heat
occurs in the **multiple** reactor tubes, and
wherein particles of **biomass** are gasified in
the presence of a steam (H₂O) carrier gas and
methane (CH₄) in a simultaneous steam
reformation and steam **biomass gasification**
reaction to produce reaction products that
include hydrogen and carbon monoxide gas
using the solar thermal energy from the
absorbed concentrated solar energy in
the **multiple** reactor tubes.

PN - [US2010303692](#) A1 20101202

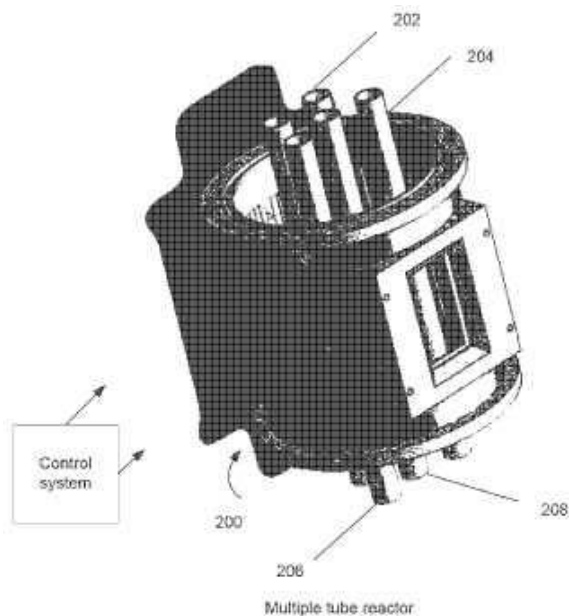
PNFP - US9150802 B2 20151006

PR - US20100795947
20100608; US20090248282P
20091002; US20090185492P 20090609

AP - US20100795947 20100608

DT - **

CT - || R141 (A1)
[US2009013601](#) A1 20090115 [] (MANDICH MITCHELL [US], et al);
[US2009014689](#) A1 20090115 [] (KLEPPER ROBERT E [US], et al);
[US2009018221](#) A1 20090115 [] (KLEPPER ROBERT E [US], et al);
[US2009018222](#) A1 20090115 [] (KLEPPER ROBERT E [US], et al);
[US2009018371](#) A1 20090115 [] (KLEPPER ROBERT E [US], et al);
[US2009018372](#) A1 20090115 [] (TIRMIZI SHAKEEL H [US], et al);
[US2010022806](#) A1 20100128 [] (MEITZNER GEORGE [US]);
[US7871457](#) B2 20110118 [] (SHAH MINISH MAHENDRA [US], et al);
[US7881825](#) B2 20110201 [] (ESPOSITO WILLIAM R [US], et al);
[US8378151](#) B2 20130219 [] (PERKINS CHRISTOPHER [US], et al);
[US2009069452](#) A1 20090312 [] (ROBOTA HEINZJUERGEN [US]);
[US2009069609](#) A1 20090312 [] (KHARAS KARL [US], et al);
[US2010075837](#) A1 20100325 [] (MEITZNER GEORGE [US], et al);
[US2010076228](#) A1 20100325 [] (ALSUM PATRICK J [US], et al);
[US7686856](#) B2 20100330 [] (HEMMINGS JOHN WILLIAM [US], et al);
[US2237491](#) A 19410408 [] (KUTZ WILLIAM H);
[US2010099925](#) A1 20100422 [] (KHARAS KARL[US]);
[US2010099926](#) A1 20100422 [] (KHARAS KARL[US]);
[US2010099927](#) A1 20100422 [] (KHARAS KARL[US]);
[US7931888](#) B2 20110426 [] (DRNEVICH RAYMOND FRANCIS [US], et al);
[US2011107661](#) A1 20110512 [] (TIRMIZI SHAKEEL H [US], et al);
[US2011107662](#) A1 20110512 [] (TIRMIZI



SHAKEEL H [US], et al);
[US2011107663](#) A1 20110512 [] (TIRMIZI
SHAKEEL H [US], et al);
[US2011124927](#) A1 20110526 [] (STITES
RONALD C [US], et al);
[US2009151251](#) A1 20090618 [
] (MANZER LEO E [US], et al);
[US2009151253](#) A1 20090618 [
] (MANZER LEO E [US], et al);
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KARL[US]);
[US2009156393](#) A1 20090618 [] (KHARAS
KARL[US]);
[US2009156697](#) A1 20090618 [] (KHARAS
KARL[US]);
[US7553476](#) B2 20090630 [] (MARRELLA
VINCENZO SALVATORE [US], et al);
[US2010137459](#) A1 20100603 [] (STITES
RONALD C [US], et al);
[US2010152497](#) A1 20100617 [] (STITES
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[US2010152498](#) A1 20100617 [] (KHARAS
KARL [US], et al);
[US2011155958](#) A1 20110630 [
] (WINTER JOHN D [US], et al);
[US7985399](#) B2 20110726 [] (DRNEVICH
RAYMOND F [US], et al);
[US2012181483](#) A1 20120719 [
] (SIMMONS WAYNE W [US], et al);
[US2010210741](#) A1 20100819 [] (KHARAS
KARL[US]);
[US2010212220](#) A1 20100826 [] (TIRMIZI
SHAKEEL H [US]);
[US8007761](#) B2 20110830 [] (DRNEVICH
RAYMOND FRANCIS [US], et al);
[US2010237291](#) A1 20100923 [
] (SIMMONS WAYNE [US], et al);
[US2010242352](#) A1 20100930 [
] (PERKINS CHRISTOPHER [US], et al);
[US2010242353](#) A1 20100930 [
] (JOVANOVIĆ ZORAN [US], et al);
[US2010242354](#) A1 20100930 [
] (PERKINS CHRISTOPHER [US], et al);
[US2010243961](#) A1 20100930 [] (HILTON
COURTLAND [US], et al);
[US2010247387](#) A1 20100930 [
] (PERKINS CHRISTOPHER [US], et al);
[US2010249251](#) A1 20100930 [] (HILTON
COURTLAND [US]);
[US2010249468](#) A1 20100930 [
] (PERKINS CHRISTOPHER [US], et al);
[US2012241677](#) A1 20120927 [
] (PERKINS CHRISTOPHER [US], et al);

[US2010270505](#) A1 20101028 [] (GALLASPY DAVID TRACY [US], et al);
[US2010273899](#) A1 20101028 [] (WINTER JOHN D [US]);
[US2010280287](#) A1 20101104 [] (KHARAS KARL [US], et al);
[US2009318573](#) A1 20091224 [] (STITES RONALD C [US], et al);
[US7632476](#) B2 20091215 [] (SHAH MINISH MAHENDRA [US], et al);
[US2010331581](#) A1 20101230 [] (KHARAS KARL [US], et al);
[US7856829](#) B2 20101228 [] (SHAH MINISH MAHENDRA [US], et al);
[US2011301732](#) A1 20111208 [] (GAO FEI [US])

- CCI - [C01B3/22](#) ; [C01B3/34](#) ; [C07C29/15](#) ;
[C07C29/1518](#) ; [C10J3/00](#) ; [C10J3/482](#) ;
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[F24S20/20](#)
- CUI - [B01J19/0013](#) ; [B01J19/0033](#) ;
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[C10J3/84](#) ; [C10K1/024](#)
- CLC - [C07C29/15](#) , [C07C31/04](#) , INV
- [C07C29/1518](#) , [C07C31/04](#) , INV
- CCA - [C10L2290/04](#) ; [C10L2290/42](#) ;
[Y02T50/678](#) ; [Y02E10/41](#) ; [Y02E50/18](#) ;
[Y02E50/32](#) ; [C10L2290/02](#) ;
[C10L2290/06](#) ; [C01B2203/0216](#) ;
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[Y02P20/136](#)
- CUA - [C10J2200/15](#) ; [B01J2219/00117](#) ;
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CQA	- Y02B40/18
PA	- (A1) SUNDROP FUELS INC [US] - (B2) PERKINS CHRISTOPHER [US]; JOVANOVIC ZORAN [US]; STRAND STEVEN [US]; HILTON COURTLAND [US]; KELLEY DONNA [US]; SUNDROP FUELS INC [US]
TI	- (A1) SYSTEMS AND METHODS FOR AN INDIRECT RADIATION DRIVEN GASIFIER REACTOR & RECEIVER CONFIGURATION - (B2) Systems and methods for an indirect radiation driven gasifier reactor and receiver configuration
AB	- (A1 B2) A method, apparatus, and system for a solar-driven chemical plant are disclosed. Some embodiments may include a solar thermal receiver to absorb concentrated solar energy from an array of heliostats and a solar-driven chemical reactor. This chemical reactor may have multiple reactor tubes, in which particles of biomass may be gasified in the presence of a carrier gas in a gasification reaction to produce hydrogen and carbon monoxide products. High heat transfer rates of the walls and tubes may allow the particles of biomass to achieve a high enough temperature necessary for substantial tar destruction and complete gasification of greater than 90 percent of the biomass particles into reaction products including hydrogen and carbon monoxide gas in a very short residence time between a range of 0.01 and 5 seconds.
32/39	© EPODOC / EPO
PN	- CN201343523Y Y 20091111
PR	- CN2009250433U 20090120
AP	- CN2009250433U 20090120
DT	- I

PA - GUANGZHOU YULIAN M & E CO LTD [CN]
 TI - Multi-wind-distribution fixed bed **biomass gasification** furnace
 AB - The utility model discloses a multi-wind-distribution fixed bed **biomass gasification** furnace, which comprises a furnace body and a fire grate, the fire grate is arranged at middle of the furnace body, a forced air intake system is arranged on the furnace body, the forced air intake system comprises an wind-supplying mechanism, a wind distribution device and a connection pipe, the wind distribution device is a wind distribution pipe which is arranged above the fire grate in the furnace body and supplies wind into the furnace at **multiple** directions, the wind-supplying mechanism is arranged outside the furnace body, and is connected with the wind distribution pipe through the connection pipe passing through the furnace wall, thereby providing forced wind source in the furnace. The utility model employs a forced air intake mode using the wind-supplying mechanism and the wind distribution device to supply wind, compared with the existing atmospheric pressure air intake mode, power of the **gasification** furnace is increased, tar content in the combustible gas is reduced, tar quantity in sewage is greatly reduced, which is favorable to environmental protection. The utility model has no especial requirement on size, drying degree and charging mode of the **biomass** raw material, thereby widening application range of the **biomass** raw material.

33/39 © EPODOC / EPO

PN - [US2005247553](#) A1 20051110

PR - JP20040085108
 20040323; JP20040180122 20040617

AP - US20050085827 20050321

DT - **

CCI - [C10J3/66](#) ; [C10J3/721](#) ; [C10J3/78](#) ;
[C10K3/006](#) ; [C10K3/04](#)

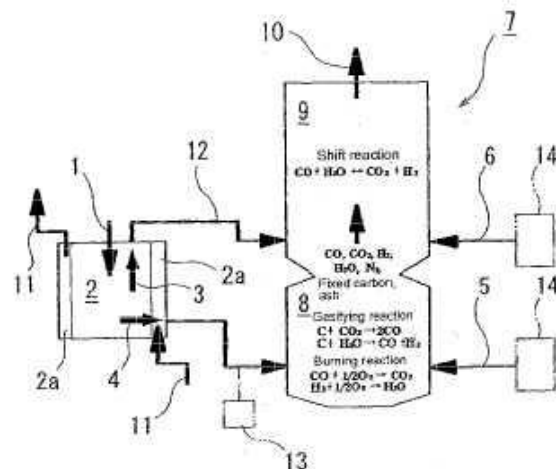
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[C10J2300/0956](#) ; [C10J2300/165](#) ;
[C10J2300/1671](#)

PA - KANAI OFFICE CORP [JP]

TI - Carbonization and **gasification** of **biomass** and power generation system

AB - **Biomass**, including waste **biomass**, is gasified by a process in which the **biomass** is first carbonized, and the char and pyrolysis gas from the carbonizer are respectively fed to a high temperature gasifying part and a gas reformer part of a two-stage gasifier. A gasifying agent is continuously fed to the gasifying part, and intermittently fed to the gas reformer, to maintain the temperature required to avoid tar formation in the gas reformer stage. **Multiple** carbonization chambers are operated in rotation. When the carbonization/ **gasification** apparatus is used to provide fuel to an electric power generator set, exhaust heat from the

Fig. 1



34/39	© EPODOC / EPO
PN	- US2008216405 A1 20080911
PR	- US20080041288 20080303; JP20040085108 20040323; JP20040180122 20040617; US20050085827 20050321
AP	- US20080041288 20080303
DT	- **
CT	- R141 (A1) US4478039 A []
CCI	- C10J3/66 ; C10J3/721 ; C10J3/78 ; C10K3/006 ; C10K3/04
CCA	- Y02E20/12 ; C10J2300/0916 ; C10J2300/094 ; C10J2300/0946 ; C10J2300/0956 ; C10J2300/165 ; C10J2300/1671
PA	- CENTRAL RES INST ELECT [JP]; KANAI OFFICE CORP [JP]
TI	- CARBONIZATION AND GASIFICATION OF BIOMASS AND POWER GENERATION SYSTEM
AB	- Biomass , including waste biomass , is gasified by a process in which the biomass is first carbonized, and the char and pyrolysis gas from the carbonizer are respectively fed to a high temperature gasifying part and a gas reformer part of a two-stage gasifier A gasifying agent is continuously fed to the gasifying part, and intermittently fed to the gas reformer, to maintain the temperature required to avoid tar formation in the gas reformer stage. Multiple carbonization chambers are operated in rotation. When the carbonization/ gasification apparatus is used to provide fuel to an electric power generator set, exhaust heat from the generator power plant is fed back to the carbonizer, and can be supplemented by exchange of heat from the gas delivered to generator power plant from the outlet of the gasifier.

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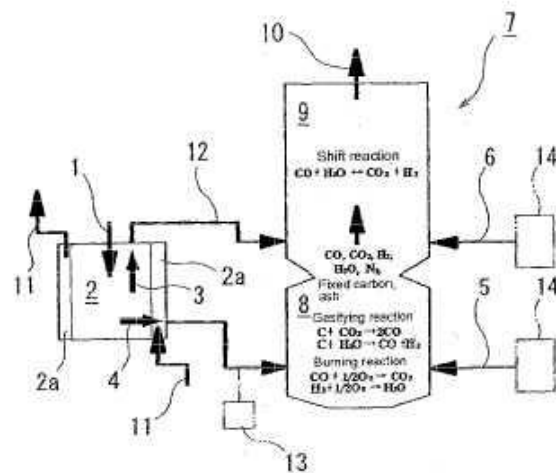
35/39 © EPODOC / EPO

PN - [CN201006868Y](#) Y 20080116
 PR - CN20062176049U 20061230
 AP - CN20062176049U 20061230
 DT - I
 PA - UNIV CHINA PETROLEUM [CN]
 TI - Coal and **biomass multiple** fluid jet combined fluidized-bed gasifying device
 AB - A multi-fluid-jet compound ebullated bed **gasification** device for coal and **biomass** comprises an ebullated bed, a synthesis gas outlet (7), an aqueous vapor inlet (1) and a fluid jet pipe, wherein the ebullated bed comprises a lower bed body (4), a middle enlarged section (5) and an upper enlarged section (6), the diameter of the middle enlarged section (5) is larger than the diameter of the lower bed body (4) and smaller than the diameter of the upper enlarged section (6), the upper enlarged section (6) is provided inside with a cyclone filter (8), the top of which is the synthesis gas outlet (7), the bottom of the lower bed body (4) is a conical structure, the fluid jet pipe comprises a main fluid feeding pipe (2) and auxiliary fluid jet pipes (3), the conical structure on the bottom of the lower bed body (4) is radially provided with two layers of the auxiliary fluid jet pipes (3), the center of the bottom of the lower bed body (4) is provided with the main fluid jet feeding pipe (2) on the same horizontal plane as the auxiliary fluid jet pipes (3), the bottom of the conical structure of the lower bed body (4) is a slag hole (10), the side of the slag hole (10) is provided with the aqueous vapor inlet (1), and a heat-insulating layer (9) is arranged outside the ebullated bed for heat preservation. The utility model has the advantages of simple construction, low costs and simple operation.

36/39 © EPODOC / EPO

PN - [CN1673317](#) A 20050928
 PNFP - CN1673317B B 20100428
 PR - JP20040085108
 20040323; JP20040180122 20040617
 AP - CN2005156829 20050322
 DT - I
 CCI - [C10J3/66](#) ; [C10J3/721](#) ; [C10J3/78](#) ;
[C10K3/006](#) ; [C10K3/04](#) ;
 CCA - [Y02E20/12](#) ; [C10J2300/0916](#) ;
[C10J2300/094](#) ; [C10J2300/0946](#) ;
[C10J2300/0956](#) ; [C10J2300/165](#) ;
[C10J2300/1671](#) ;
 PA - (A)
 CENTRAL RES INST ELECT [JP]
 - (B)
 CENTRAL RES INST ELECT; KANAI OFFICE
 CORP
 TI - (A B)
 Carbonization and **gasification** of **biomass**
 and power generation system
 AB - (B)
Biomass, including waste **biomass**, is
 gasified by a process in which
 the **biomass** is first carbonized, and the

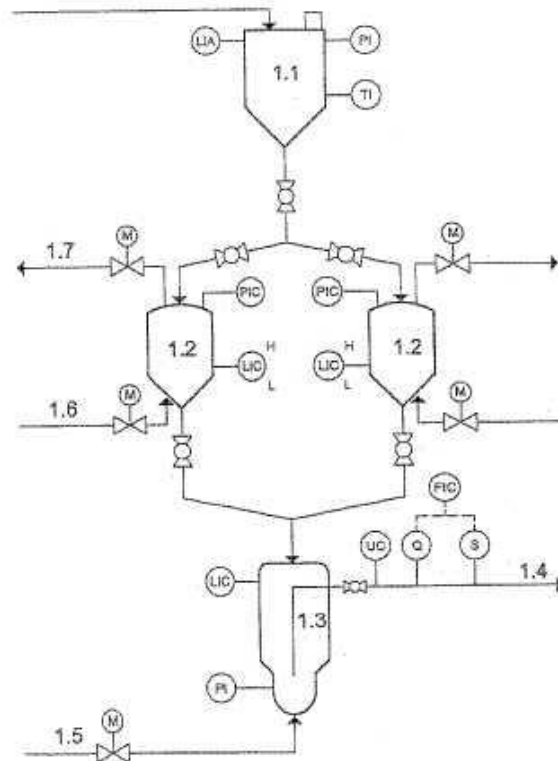
Fig. 1



char and pyrolysis gas from the carbonizer are respectively fed to a high temperature gasifying part and a gas reformer part of a two-stage gasifier. A gasifying agent is continuously fed to the gasifying part, and intermittently fed to the gas reformer, to maintain the temperature required to avoid tar formation in the gas reformer stage. **Multiple** carbonization chambers are operated in rotation. When the carbonization/ **gasification** apparatus is used to provide fuel to an electric power generator set, exhaust heat from the generator power plant is fed back to the carbonizer, and can be supplemented by exchange of heat from the gas delivered to generator power plant from the outlet of the gasifier.

37/39 © EPODOC / EPO

- PN - [CA2534407](#) A1 20070407
- PR - DE20051048488 20051007
- AP - CA20062534407 20060126
- DT - I
- CCI - [C10J3/466](#) ; [C10J3/506](#) ; [C10J3/84](#) ;
[C10J3/845](#) ; [C10K1/101](#)
- CCA - [C10J2300/0916](#) ; [C10J2300/093](#) ;
[C10J2300/0959](#) ; [C10J2300/1634](#) ;
[C10J2300/1687](#) ; [C10J2200/156](#) ;
[C10J2200/09](#) ; [Y02P20/145](#) ;
[Y02P20/129](#)
- PA - SCHINGNITZ MANFRED [DE]; FUTURE ENERGY GMBH [DE]
- TI - METHOD AND DEVICE FOR HIGH-CAPACITY ENTRAINED FLOW GASIFIER
- AB - This invention relates to a method for the **gasification** of pulverized fuels that exist from solid fuels such as bituminous coals, lignite coals, and their cokes, petroleum cokes, coke from peat or **biomass**, in entrained flow, with an oxidizing medium containing free oxygen, by partial oxidation at pressures between atmospheric pressure and 80 bar, and at temperatures between 1,200 and 1,900.degree.C, at high reactor capacities between 1,000 and 1,500 MW, consisting of the component technologies: metering of the



fuel, **gasification** reaction in a **gasification** reactor with cooled reaction chamber contour, quench-cooling, crude gas scrubbing, and partial condensation, wherein a fuel, preferably a pulverized fuel, with a water content < 10 wt.% and a grain size < 200 .mu.m, is supplied to **multiple** identically engaged metering systems that feed the fuel, preferably the pulverized fuel, through transport pipes (1.4) to **multiple gasification** burners (2.1) located at the head of a reactor (2), which are symmetrically arranged and contain additional oxygen infeeds, **multiple** dust burners (2.1) with oxygen infeed are ignited in the head of the **gasification** reactor (2) by ignition and pilot burners (2.2), the quantities of the pulverized fuel and oxygen fed to the dust burners (2.1) are determined, with the overall total of all amounts of pulverized fuel and oxygen supplied being determined, and with a regulating mechanism assuring that the oxygen ratio neither exceeds nor falls below a ratio of 0.35 to 0.65, regardless of the distribution of pulverized fuel and oxygen to the burners (2.1), the pulverized fuel is converted in the **gasification** reactor (2) at temperatures between 1,200 and 1,900.degree.C and at pressures between atmospheric pressure and 80 bar, into a crude synthesis gas and slag, the hot crude gas at 1,200 to 1,900.degree.C and the slag are cooled together down to the condensation point at temperatures between 180.degree.C and 240.degree.C in a quenching cooler (3) by injecting water, the cooled crude gas is fed to further treatment stages such as water scrubbing, partial condensation, or catalytic processes, and devices for implementing the method.

PN - [CA2501841](#) A1 20050923

PNFP - CA2501841 C 20120710

PR - JP20040085108
20040323; JP20040180122 20040617

AP - CA20052501841 20050321

DT - I

CCI - [C10J3/66](#) ; [C10J3/721](#) ; [C10J3/78](#) ;
[C10K3/006](#) ; [C10K3/04](#)

CCA - [Y02E20/12](#) ; [C10J2300/0916](#) ;
[C10J2300/094](#) ; [C10J2300/0946](#) ;
[C10J2300/0956](#) ; [C10J2300/165](#) ;
[C10J2300/1671](#)

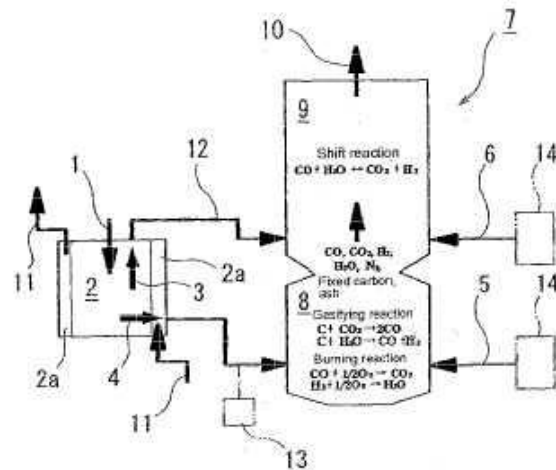
PA - (A1)
KANAI OFFICE CORP [JP]; CENTRAL RES
INST ELECT [JP]

(C)
CENTRAL RES INST ELECT [JP]; KANAI
OFFICE CORP [JP]

TI - (A1 C)
CARBONIZATION AND **GASIFICATION**
OF **BIOMASS** AND POWER GENERATION
SYSTEM

AB - (A1 C)
Biomass, including waste **biomass**, is
gasified by a process in which
the **biomass** is first carbonized, and the
char and pyrolysis gas from the
carbonizer are respectively fed to a high
temperature gasifying part and a gas
reformer part of a two-stage gasifier. A
gasifying agent is continuously fed to the
gasifying part, and intermittently fed to
the gas reformer, to maintain the
temperature required to avoid tar
formation in the gas reformer
stage. **Multiple** carbonization chambers
are operated in rotation. When the
carbonization/ **gasification** apparatus is
used to provide fuel to an electric power
generator set, exhaust heat from the
generator power plant is fed back to the
carbonizer, and can be supplemented by
exchange of heat from the gas delivered
to generator power plant from the outlet
of the gasifier.

Fig. 1



PN - [AU2006201142](#) A1 20070426

PNFP - [AU2006201142B](#) B2 20110721

PR - [DE20051048488](#) 20051007

AP - [AU20060201142](#) 20060320

DT - I

CT - || STSE (B2)

[DE19718131](#) A1 19981105 [] (SCHINGNITZ MANFRED DR [DE], et al)

[CN27001718Y](#) Y 00000000 []

[DE102005041930](#) A1 20070301 [] (HOLLE BERND [DE], et al)

[US3988123](#) A 19761026 [] (COATES RALPH L)

[DE4446803](#) A1 19960627 [] (SCHINGNITZ MANFRED [DE], et al)

[US2004261316](#) A1 20041230 [] (WEAVER LLOYD E [US])

[US4781731](#) A 19881101 [] (SCHLINGER WARREN G [US])

[US4971550](#) A 19901120 [] (SCHINGNITZ MANFRED [DD], et al)

[EP0677567](#) B1 19970924 [] (CHILD EDWARD TAYLOR [US])

[US5968212](#) A 19991019 [] (PEISE HELMUT [DE], et al)

[GB2164951](#) A 19860403 [] (VAN KESSEL MATHEUS MARIA, et al)

[GB2004993](#) A 19790411 []

[DE3534015](#) A1 19860403 [] (KESSEL MATHEUS MARIA VAN [NL], et al)

[DE102005041931](#) A1 20070308 [] (HOLLE BERND [DE], et al)

[WO9617904](#) A1 19960613 [] (BROOKER DONALD DUANE [US], et al)

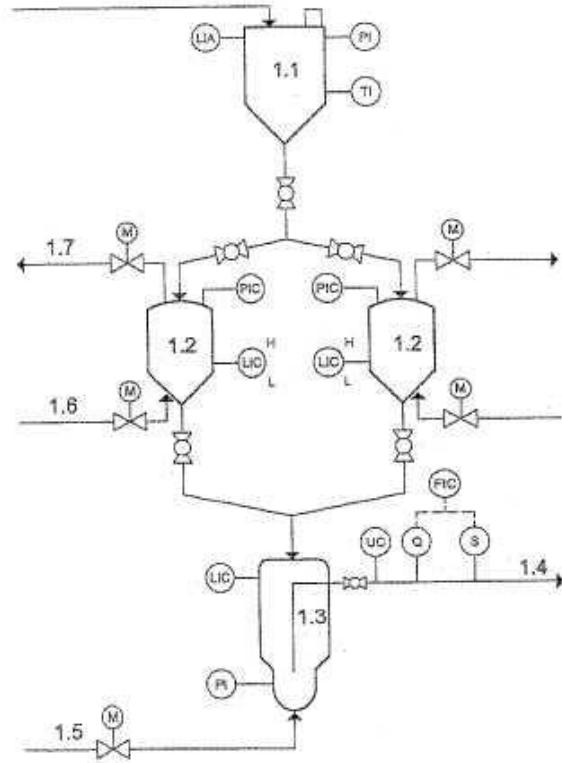
[US5725615](#) A 19980310 [] (MORIYAMA ATSUSHI [JP], et al)

CCI - [C10J3/466](#) ; [C10J3/506](#) ; [C10J3/84](#) ; [C10J3/845](#) ; [C10K1/101](#)

CCA - [C10J2300/0916](#) ; [C10J2300/093](#) ; [C10J2300/0959](#) ; [C10J2300/1634](#) ; [C10J2300/1687](#) ; [C10J2200/156](#) ; [C10J2200/09](#) ; [Y02P20/145](#) ; [Y02P20/129](#)

PA - (A1)
FUTURE ENERGY GMBH; SCHINGNITZ MANFRED

- (B2)
SIEMENS FUEL GASIFICATION TECHNOLOGY GMBH; SCHINGNITZ MANFRED



TI	- (A1 B2) Method and device for high-capacity entrained flow gasifier
AB	- (B2) This invention relates to a method for the gasification of pulverized fuels that exist from solid fuels such as bituminous coals, lignite coals, and their cokes, petroleum cokes, coke from peat or biomass, in entrained flow, with an oxidizing medium containing free oxygen, by partial oxidation at pressures between atmospheric pressure and 80 bar, and at temperatures between 1,200 and 1,900 °C, at high reactor capacities between 1,000 and 1,500 MW, consisting of the component technologies: metering of the fuel, gasification reaction in a gasification reactor with cooled reaction chamber contour, quench-cooling, crude gas scrubbing, and partial condensation, wherein - a fuel, preferably a pulverized fuel, with a water content < 10 wt.% and a grain size < 200 gm, is supplied to multiple identically engaged metering systems that feed the fuel, preferably the pulverized fuel, through transport pipes (1.4) to multiple gasification burners (2.1) located at the head of a reactor (2), which are symmetrically arranged and contain additional oxygen infeeds, S: P59914 multiple dust burners (2.1) with oxygen infeed are ignited in the head of the gasification reactor (2) by ignition and pilot burners (2.2), the quantities of the pulverized fuel and oxygen fed to the dust burners (2.1) are determined, with the overall total of all amounts of pulverized fuel and oxygen supplied being determined, and with a regulating mechanism assuring that the oxygen ratio neither exceeds nor falls below a ratio of 0.35 to 0.65, regardless of the distribution of pulverized fuel and oxygen to the burners (2.1), the pulverized fuel is converted in the gasification reactor (2) at temperatures between 1,200 and 1,900 °C and at pressures between atmospheric pressure and 80 bar, into a crude synthesis gas and slag, the hot

crude gas at 1,200 to 1,900 °C and the slag are cooled together down to the condensation point at temperatures between 180 °C and 240 °C in a quenching cooler (3) by injecting water, the cooled crude gas is fed to further treatment stages such as water scrubbing, partial condensation, or catalytic processes, and devices for implementing the method. S:P59914 4/5
Fig.4 1.1 2.1 Fg \2 3.2 3.4 3.1 -.

[SS 7] ..v

[EPODOC: SS 7]